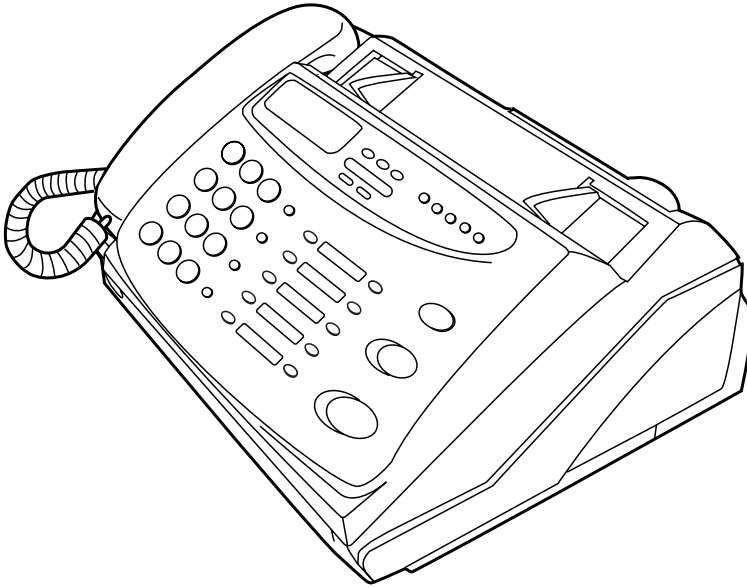


# SHARP SERVICE MANUAL

No. 00ZUX258THSME



## FACSIMILE

### UX-258

### MODEL FO-475

#### CONTENTS

##### CHAPTER 1. GENERAL DESCRIPTION

- [1] Specifications ..... 1-1
- [2] Operation panel ..... 1-2
- [3] Transmittable documents ..... 1-3
- [4] Installation ..... 1-4
- [5] Quick reference guide ..... 1-7

##### CHAPTER 2. ADJUSTMENTS

- [1] Adjustments ..... 2-1
- [2] Diagnostics and service soft switch ..... 2-2
- [3] Troubleshooting ..... 2-17
- [4] Error code table ..... 2-18

##### CHAPTER 3. MECHANISM BLOCKS

- [1] General description ..... 3-1
- [2] Disassembly and assembly  
procedures ..... 3-3

##### CHAPTER 4. DIAGRAMS

- [1] Block diagram ..... 4-1
- [2] Wiring diagram ..... 4-2
- [3] Point-to-point diagram ..... 4-3

##### CHAPTER 5. CIRCUIT DESCRIPTION

- [1] Circuit description ..... 5-1
- [2] Circuit description of control PWB ..... 5-2
- [3] Circuit description of TEL/LIU PWB ..... 5-8
- [4] Circuit description of  
power supply PWB ..... 5-11
- [5] Circuit description of CIS unit ..... 5-11

##### CHAPTER 6. CIRCUIT SCHEMATICS AND PARTS LAYOUT

- [1] Control PWB circuit ..... 6-1
- [2] TEL/LIU PWB circuit ..... 6-9
- [3] Power supply PWB circuit ..... 6-11
- [4] Operation panel PWB circuit ..... 6-13

##### CHAPTER 7. OPERATION FLOWCHART

- [1] Protocol ..... 7-1
- [2] Power on sequence ..... 7-2

##### CHAPTER 8. OTHERS

- [1] Service tools ..... 8-1
  - [2] IC signal name ..... 8-4
- PARTS GUIDE

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

**SHARP CORPORATION**

This document has been published to be used  
for after sales service only.  
The contents are subject to change without notice.

#### CAUTION FOR BATTERY REPLACEMENT

(Danish)

ADVARSEL !

Lithiumbatteri-Eksplosionsfare ved fejlagtig håndtering.  
Udskiftning må kun ske med batteri af samme fabrikat og type.  
Levér det brugte batteri tilbage til leverandoren.

(English)

Caution !

Danger of explosion if battery is incorrectly replaced.  
Replace only with the same or equivalent type  
recommended by the equipment manufacturer.  
Discard used batteries according to manufacturer's  
instructions.

(Finnish)

VAROITUS

Paristo voi räjähtää, jos se on virheellisesti asennettu.  
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan  
tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden  
mukaisesti.

(French)

ATTENTION

Il y a danger d'explosion s' il y a remplacement incorrect  
de la batterie. Remplacer uniquement avec une batterie du  
même type ou d'un type recommandé par le constructeur.  
Mettre au rebut les batteries usagées conformément aux  
instructions du fabricant.

(Swedish)

VARNING

Explosionsfare vid felaktigt batteribyte.  
Använd samma batterityp eller en ekvivalent  
typ som rekommenderas av apparattillverkaren.  
Kassera använt batteri enligt fabrikantens  
instruktion.

(German)

Achtung

Explosionsgefahr bei Verwendung inkorrektter Batterien.  
Als Ersatzbatterien dürfen nur Batterien vom gleichen Typ oder  
vom Hersteller empfohlene Batterien verwendet werden.  
Entsorgung der gebrauchten Batterien nur nach den vom  
Hersteller angegebenen Anweisungen.

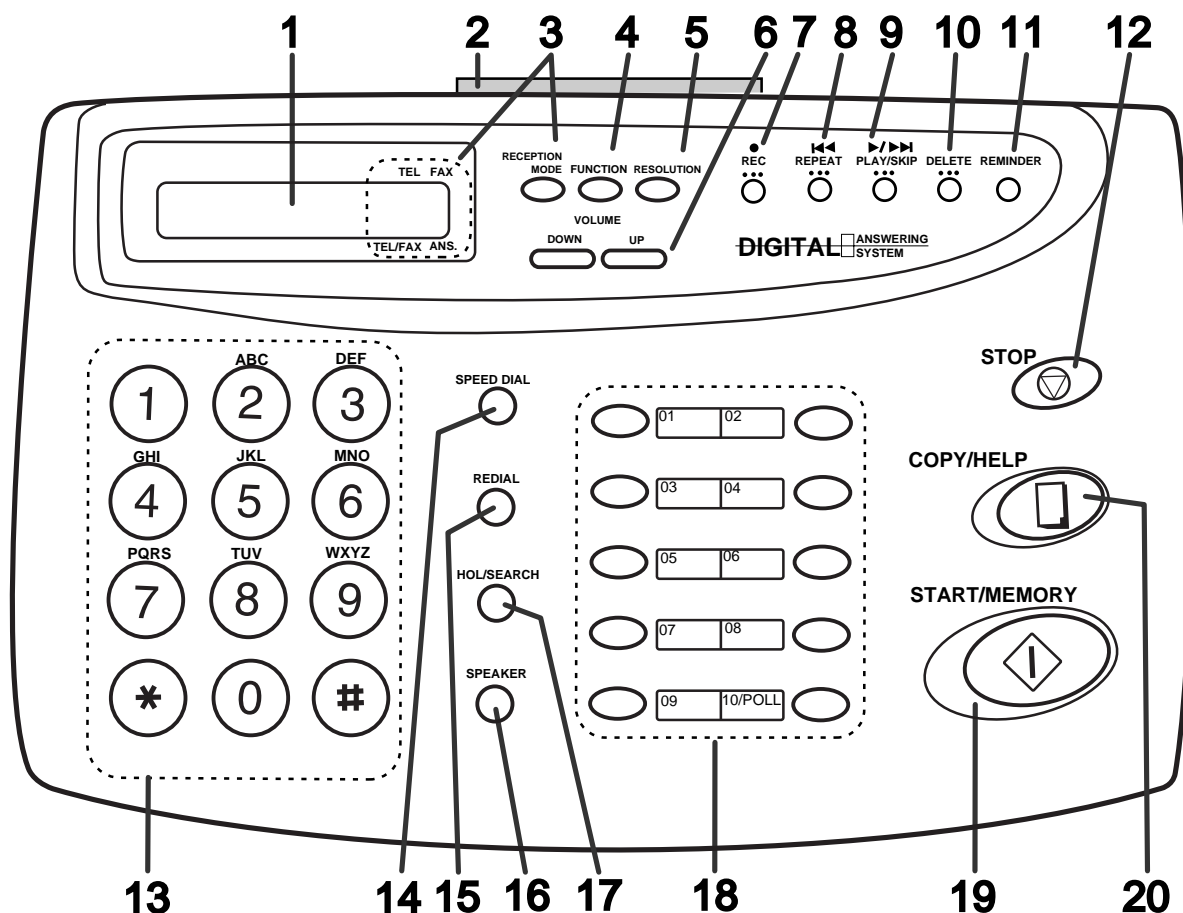
# CHAPTER 1. GENERAL DESCRIPTION

## [1] Specifications

<b>Automatic dialing:</b>	Rapid Key Dialing: 10 numbers Speed Dialing: 20 numbers	<b>Effective scanning width:</b>	210 mm max.
<b>Fax paper:</b>	Initial starter roll (included with fax machine): 10 m roll  Recommended replacement roll: FO-40PR 50 m roll	<b>Contrast control:</b>	Automatic/Dark selectable
<b>Automatic document feeder:</b>	10 sheets max.	<b>Copy function:</b>	Standard
<b>Paper cutting method:</b>	Automatic cutter	<b>Telephone function:</b>	Standard (cannot be used for incoming/outgoing if power fails)
<b>Modem speed:</b>	9600 bps with automatic fallback to 7200, 4800, or 2400 bps	<b>Power requirements:</b>	220-240 V, 50 Hz
<b>Transmission time* :</b>	Approx. 15 seconds (Sharp special mode)	<b>Operating temperature:</b>	5 to 35°C
<b>Display:</b>	7 x 5 dots, 1 line by 16-digit display	<b>Humidity:</b>	Maximum: 85 %
<b>Reception modes:</b>	TEL, FAX, TEL/FAX, ANS.	<b>Power consumption:</b>	Stand-by: 6.0 W Maximum: 120 W
<b>Resolution:</b>	Horizontal: 8 dots/mm Vertical: Standard: 3.85 lines/mm Fine/Halftone: 7.7 lines/mm Super fine: 15.4 lines/mm	<b>Dimensions:</b>	Width: 308 mm Depth: 256 mm Height: 138 mm
<b>Recording system:</b>	Thermal recording	<b>Weight:</b>	Approx. 2.6 kg (without attachments)
<b>Halftone (grayscale):</b>	64 levels	* Based on ITU-T (CCITT) Test Chart #1 at standard resolution in Sharp special mode, excluding time for protocol signals (i.e., ITU-T phase C time only).	
<b>Applicable telephone line:</b>	Public switched telephone network/PBX		
<b>Compatibility:</b>	ITU-T (CCITT) G3 mode		
<b>Configuration:</b>	Half-duplex, desktop transceiver		
<b>Compression scheme:</b>	MH, MR, Sharp special mode		
<b>Scanning method:</b>	Sheet-feeder CIS (Contact Image Sensor)		
<b>Effective recording width:</b>	210 mm max.		
<b>Input document size:</b>	Automatic feeding: Width — 148 to 216 mm Length — 140 to 297 mm Manual feeding: Width — 148 to 216 mm Length — 140 to 600 mm		

As a part of our policy of continuous improvement, SHARP reserves the right to make design and specification changes for product improvement without prior notice. The performance specifications figures indicated are nominal values of production units. There may be some deviation from these values in individual units.

## [2] Operation panel

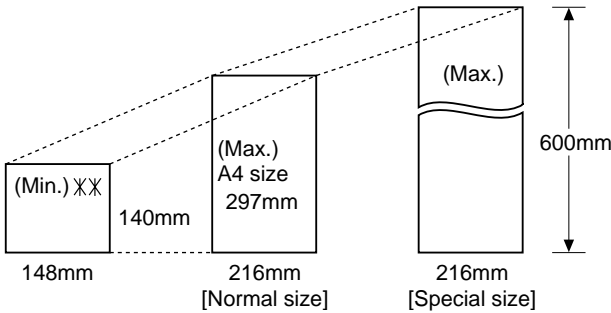


- 1. Display**  
This displays messages and prompts during operation and programming.
- 2. PANEL RELEASE**  
Pull this release toward you to open the operation panel.
- 3. RECEPTION MODE key**  
Press this key to select the reception mode. An arrow in the display will point to the currently selected reception mode.
- 4. FUNCTION key**  
Press this key to select various special function.
- 5. RESOLUTION key**  
Press this key to adjust the resolution and contrast before sending or copying a document.
- 6. VOLUME keys**  
Press these keys to adjust the volume of the speaker when the **SPEAKER** key has been pressed, or the volume of the ringer at all other times.
- 7. REC key**  
Press this key to record a phone conversation or a message.
- 8. REPEAT key**  
Press this key to repeat playback of a message.
- 9. PLAY/SKIP key**  
Press this key to play recorded messages. During playback, press it to skip forward to the next message.
- 10. DELETE key**  
Press this key to erase recorded messages.
- 11. REMINDER key**  
Press this key to send a fax and/or voice message to another party or to yourself at a preset time.
- 12. STOP key**  
Press this key to stop operations before they are completed.
- 13. Number keys**  
Use these keys to dial numbers, and enter number and letters during number/name storing procedures.
- 14. SPEED DIAL key**  
Press this key to dial a 2-digit Speed Dial number.
- 15. REDIAL key**  
Press this key to automatically redial the last number dialed.
- 16. SPEAKER key**  
Press this key to hear the line and fax tones through the speaker when sending a document, or dialing a voice number.  
Note: **This is not a speakerphone.** You must pick up the handset to talk with the other party.
- 17. HOLD/SEARCH key**  
Press this key to search for an automatic dialing number, or, during a phone conversation, press this key to put the other party on hold.
- 18. Rapid Dial keys**  
Press one of these keys to dial a fax or voice number automatically. (Note that you must attach the Rapid Key labels.)
- 19. START/MEMORY key**  
Press this key to send or receive a document manually when off hook.
- 20. COPY/HELP key**  
When a document is in the feeder, press this key to make a copy. At any other time, press this key to print out the Help List, a quick reference guide to the operation of your fax.

### [3] Transmittable documents

#### 1. Document Sizes

Normal size	width	148 – 216 mm
	length	140 – 297 mm



XX Use document carrier sheet for smaller documents.

\* With special sizes, only one sheet can be fed into the machine at a time. Insert next page into feeder as current page is being scanned.

#### 2. Paper Thickness & Weight

Normal size	ADF 10 sheets	Thickness	$2.4 \times 10^{-3} - 4.7 \times 10^{-3}$ inch
		Weight	$0.15 \times 10^{-3}$ lbs/inch <sup>2</sup>
Special size		Thickness	$4.7 \times 10^{-3} - 7.9 \times 10^{-3}$ inch
		Weight	$0.15 \times 10^{-3} - 0.20 \times 10^{-3}$ lbs/inch <sup>2</sup>

#### 3. Document Types

- Normal paper  
Documents handwritten in pencil (No. 2 lead or softer), fountain pen, ball-point pen, or felt-tipped pen can be transmitted.  
Documents of normal contrast duplicated by a copying machine can also be transmitted.
- Diazo copy (blue print)  
Diazo copy documents of a normal contrast may be transmitted.
- Carbon copy  
A carbon copy may be transmitted if its contrast is normal.

#### 4. Cautions on Transmitting Documents

- Documents written in yellow, greenish yellow, or light blue ink cannot be transmitted.
- Ink, glue, and correcting fluid on documents must be dry before the documents can be transmitted.
- All clips, staples and pins must be removed from documents before transmission.
- Patched (taped) documents should be copied first on a copier and then the copies used for transmission.
- All documents should be fanned before insertion into the feeder to prevent possible double feeds.

#### 5. Automatic Document Feeder Capacity

Number of pages that can be placed into the feeder at anytime is as follows:

Normal size: max. ADF 10 sheets

Special size: single sheet only (manual feed)

- NOTES:
- When you need to send or copy more pages than the feeder limit, place additional pages in feeder when last page in feeder is being scanned.
  - Place additional pages carefully and gently in feeder. If force is used, double-feeding or a document jam may result.

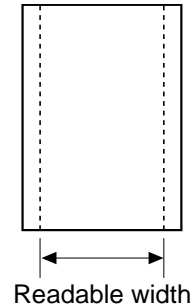
#### 6. Readable Width & Length

The readable width and length of a document are slightly smaller than the actual document size.

Note that characters or graphics outside the effective document scanning range will not be read.

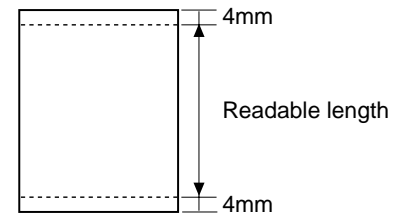
##### • Readable width

210 mm, max.



##### • Readable length

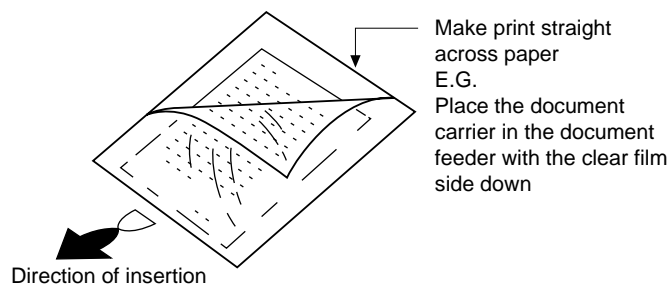
This is the length of the document sent minus 4 mm from the top and bottom edges.



## 7. Use of Document Carrier Sheet

A document carrier sheet must be used for the following documents.

- Those with tears.
- Those smaller than size 140 mm (W) x 140 mm (L).
- Carbon-backed documents



**NOTE:** To transmit a carbon-backed document, insert a white sheet of paper between the carbon back of the document and the document carrier.

- Those containing an easily separable writing substance (e.g., tracing paper written on with a soft, heavy lead pencil).

**NOTES:**

- When using the document carrier, carefully read the instructions written on the back.

- If the document carrier is dirty, clean it with a soft, moist cloth, and then dry it before using for transmission.
- Do not place more than one document in the carrier at a time.

## [4] Installation

### 1. Site selection

Take the following points into consideration when selecting a site for this model.

#### ENVIRONMENT

- The machine must be installed on a level surface.
- Keep the machine away from air conditioners, heaters, direct sunlight, and dust.
- Provide easy access to the front, back, and sides of the machine. In particular, keep the area in front of the machine clear, or the original document may jam as it comes out after scanning.
- The temperature should be between 5° and 35°C.
- The humidity should be between 30% and 85% (without condensation).

#### ELECTRICITY

220-240 V, 50 Hz, earthed (2-prong) AC outlet is required.

#### Caution!

- Connection to a power source other than that specified will cause damage to the equipment and is not covered under the warranty.
- If your area experiences a high incidence of lightning or power surges, we recommend that you install a surge protector for the power and telephone lines. Surge protectors can be purchased at most telephone specialty stores.

#### If the machine is moved from a cold to a warm place...

If the machine is moved from a cold to a warm place, it is possible that the reading glass may fog up, preventing proper scanning of documents for transmission. To remove the fog, turn on the power and wait approximately 2 hours before using the machine.

## TELEPHONE JACK

A standard telephone jack must be located near the machine.

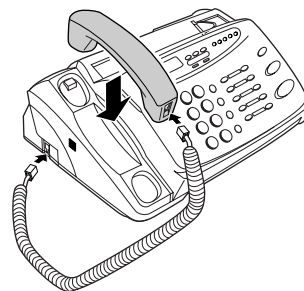
This is the telephone jack commonly used in most homes and offices.

- Plugging the fax machine into a jack which is not an jack may result in damage to the machine or your telephone system. If you do not know what kind of jack you have, or needed to have one installed, contact the telephone company.

## 2. Connections

① Connect the handset as shown and place it on the handset rest.

- ♦ Make sure the handset cord goes into the unmarked jack on the side of the machine!
- ♦ Use the handset to make ordinary phone calls, or to transmit and receive documents manually.



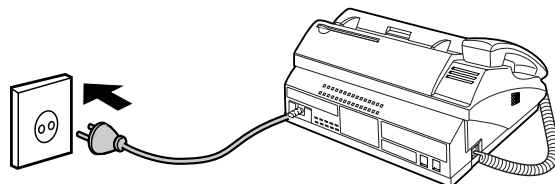
② Plug the power cord into a 220-240 V, 50 Hz, earthed (2-prong) AC outlet.

- ♦ **Caution:** Do not plug the power cord into any other kind of outlet. This will damage the machine and is not covered under the warranty.

**Note:** The shape of the plug is different in certain countries.

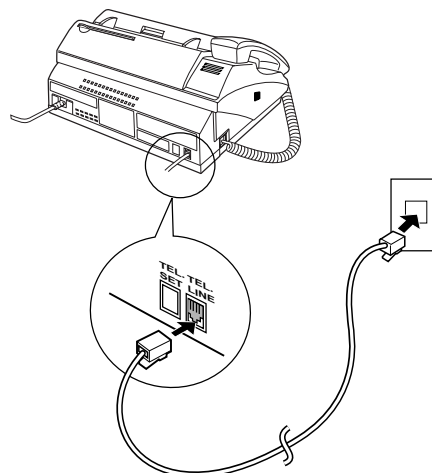
- ♦ The machine does not have a power on/off switch, so the power is turned on and off by simply plugging or unplugging the power cord.

**Note:** If your area experiences a high incidence of lightning or power surges, we recommend that you install surge protectors for the power and telephone lines. Surge protectors can be purchased from your dealer or at most telephone specialty stores.



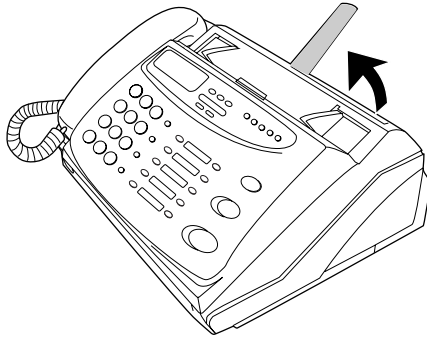
③ Insert one end of the telephone line cord into the "TEL. LINE" jack. Insert the other end into a standard (RJ11C) single-line telephone wall jack.

- ♦ Be sure to insert the telephone line cord into the "TEL. LINE" jack. **Do not** insert into the "TEL. SET" jack.



### 3. Original document support

- ① Rotate the original document support so that it points straight out.

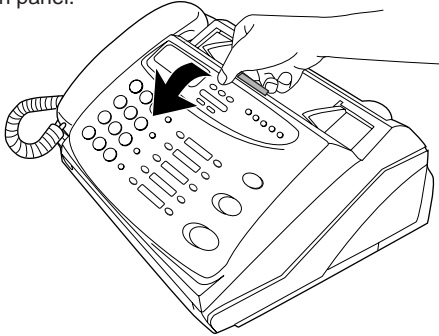


### 4. Loading the fax paper

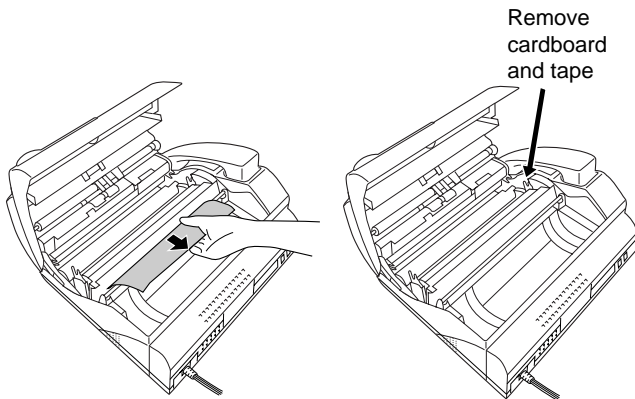
- Your fax machine prints incoming faxes on a special kind of paper called thermal paper.
- The fax's print head creates text and images by applying heat to the thermal paper.

**Note:** The power must be on (plug in the power cord) when loading fax paper in the fax machine.

- ① Pull the release marked **PANEL RELEASE** toward you and open the operation panel.

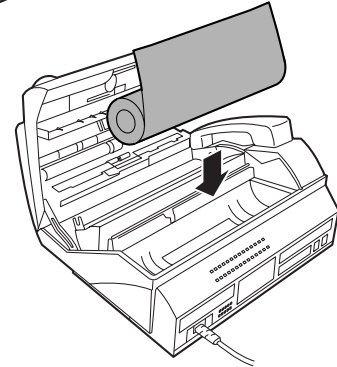
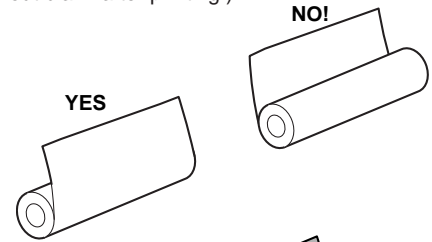


- ② Remove the packing paper from the paper compartment.

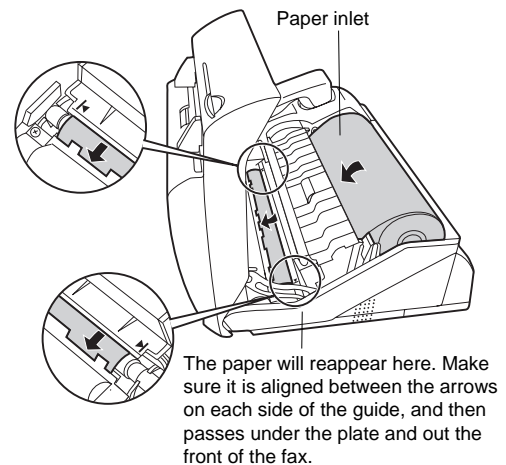


- ③ Unwrap the roll of fax paper and place it in the compartment.

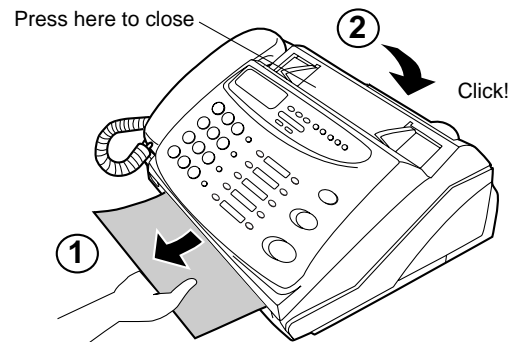
- **Important:** The roll must be placed so that the leading edge of the paper unrolls as shown. (The paper is only coated on one side for printing. If the roll is placed backwards, the paper will come out blank after printing.)



- ④ Insert the leading edge of the paper into the paper inlet. Continue to push the paper through the inlet until it comes out of the opening in the front of the fax.



- ⑤ Close the operation panel, making sure it clicks into place.



- ⑥ A short length of the fax paper will feed out and be cut off. (If this doesn't happen, repeat the loading procedure.)

**Note:** The fax has a built-in anti-curl mechanism that will help to reduce paper curling problems. The anti-curl mechanism is more effective at the beginning of the paper roll and less effective towards the end.

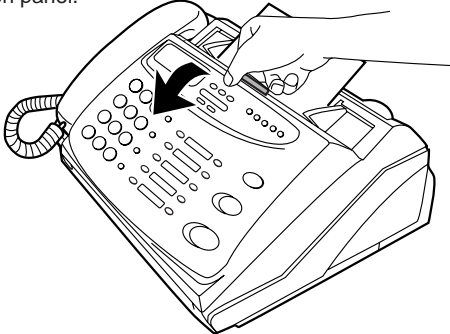


4. Clearing a jammed document

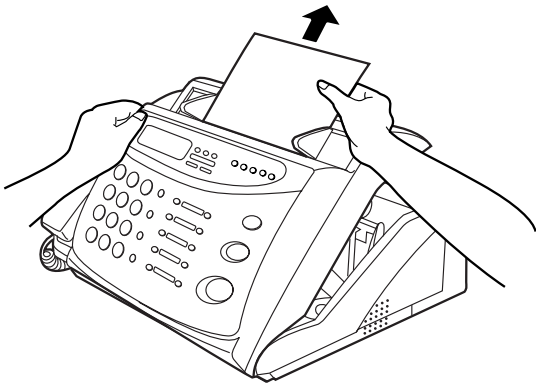
If the original document doesn't feed properly during transmission or copying, or DOCUMENT JAMMED appears in the display, first try pressing the **START/MEMORY** key. If the document doesn't feed out, open the operation panel and remove it.

**Important:** Do not try to remove a document without opening the operation panel. This may damage the feeder mechanism.

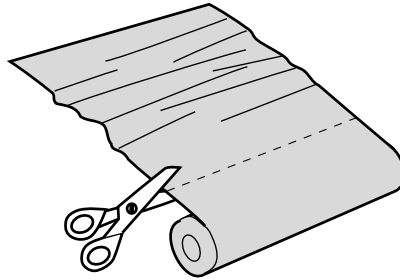
- ① Pull the release marked **PANEL RELEASE** toward you and open the operation panel.



- ② Remove the document.

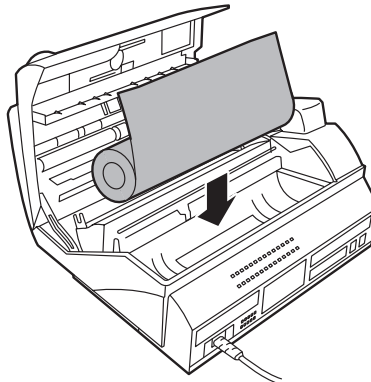


- ③ Cut off the wrinkled part of the paper.



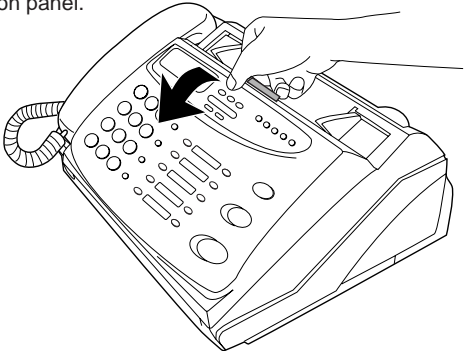
- ④ Reload the paper.

- Jammed fax paper is often caused by improper loading. Be sure to carefully follow the instructions for paper loading given in "Loading the Fax Paper" in page 1-5.



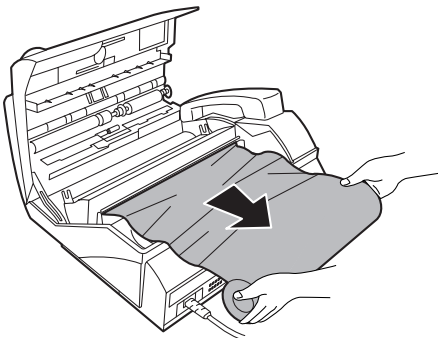
5. Clearing jammed fax paper

- ① Pull the release marked **PANEL RELEASE** toward you and open the operation panel.



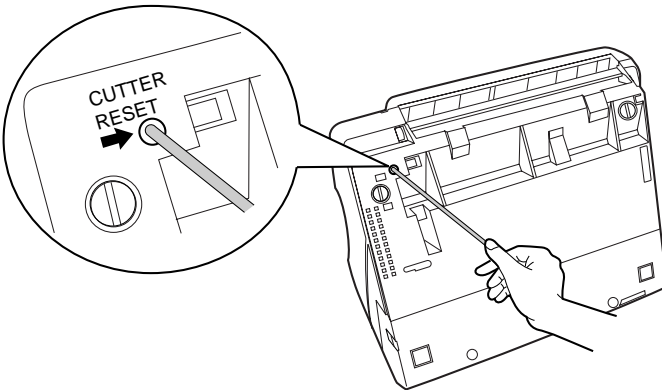
- ② Remove the paper roll.

- If any pieces of paper are stuck in the cutter, remove them with caution.
- Press the **START/MEMORY** key to reset the cutter.



- ⑤ If the display still shows PAPER JAMMED

If the display still shows PAPER JAMMED after you press the **START/MEMORY** key in Step 2 above, the cutter is still engaged in the cutting position. To open the cutter, turn the fax up on its rear end and insert any long, rod-like object with a flat or blunt end into the hole marked **CUTTER RESET**. Continue to push the rod in until you feel it move a lever inside the machine.



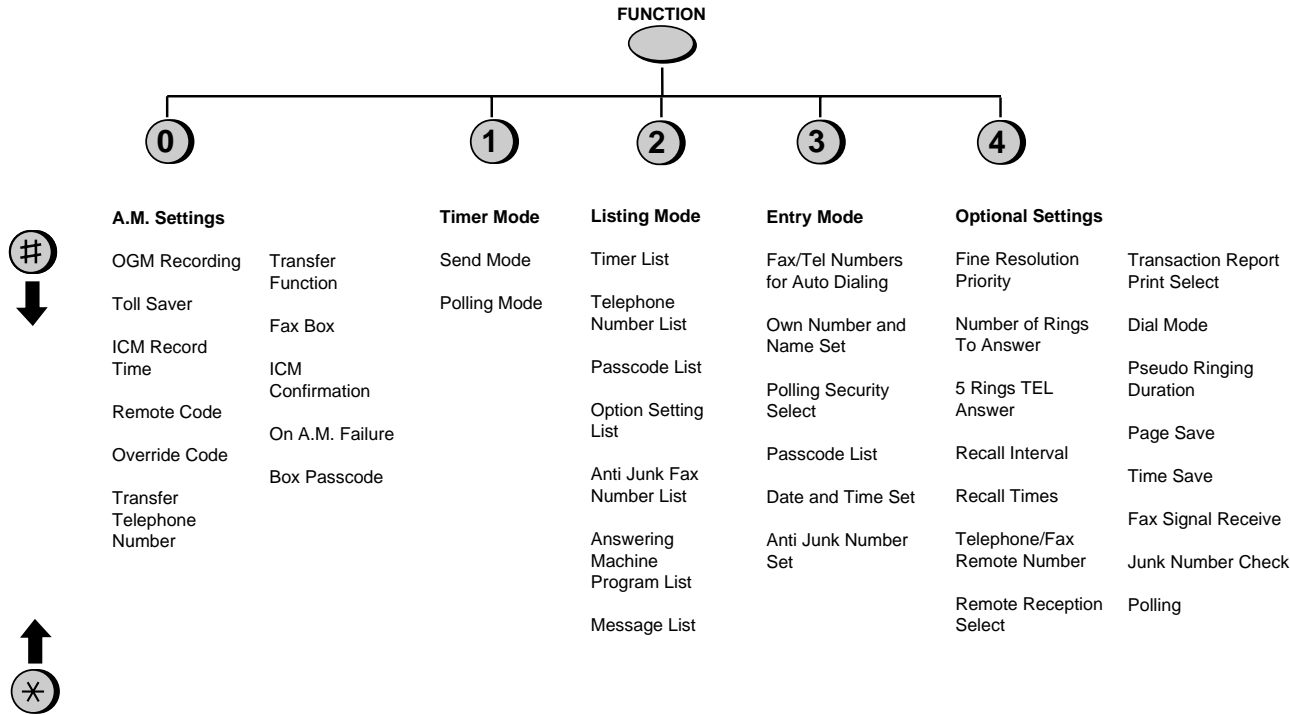
ABC 1	DEF 2	DEF 3	SPEED DIAL Press this key to delete the letter highlighted by the cursor.
GHI 4	JKL 5	MNO 6	REDIAL Press this key to move the cursor to the left.
PQRS 7	TUV 8	WXYZ 9	HOLD/SEARCH Press this key to change case.
* Press either key repeatedly to select one of the following symbols.	0	#	SPEAKER Press this key to move the cursor to the right.



## [5] Quick reference guide

### FUNCTION key menu

The following chart shows the layout of the functions and settings accessed by pressing the **FUNCTION** key. First press the **FUNCTION** key, the appropriate numeric key as shown, and then "#" or "\*" until the desired item appears. Instructions for making each setting appear in the display. If you have any difficulty, refer to the detailed instructions on the page shown below the setting.



**Note:** Steps which are optional are enclosed in a dotted frame:

### Transmitting documents

<b>Normal Dialing</b>	Load document → <span style="border: 1px dotted black; padding: 2px;">RESOLUTION</span> → Lift handset or press <b>SPEAKER</b> → Dial (press numeric keys) → Wait for reception tone → <b>START/MEMORY</b> → Hang up
<b>Direct Keypad Dialing</b>	Load document → <span style="border: 1px dotted black; padding: 2px;">RESOLUTION</span> → Dial (press numeric keys) → <b>START/MEMORY</b>
<b>Rapid Key Dialing</b>	Load document → <span style="border: 1px dotted black; padding: 2px;">RESOLUTION</span> → Press Rapid key
<b>Speed Dialing</b>	Load document → <span style="border: 1px dotted black; padding: 2px;">RESOLUTION</span> → <b>SPEED DIAL</b> → Enter Speed Dial number (press 2 numeric keys) → <b>START/MEMORY</b>
<b>Redialing</b>	Load document → <span style="border: 1px dotted black; padding: 2px;">RESOLUTION</span> → <b>REDIAL</b> → Wait for reception tone → <b>START/MEMORY</b>

### Using the answering machine

<b>Recording an outgoing message</b>	<p><b>FUNCTION</b></p> <p>Press a number key to select a box:</p> <p>"0": General Box</p> <p>"1": Box 1</p> <p>"2": Box 2</p> <p>"3": Box 3</p> <p>"4": Transfer outgoing message</p> <p>Pick up the handset, press the <b>START/MEMORY</b> key, and then speak into the handset.</p> <p>When finished, replace the handset or press the <b>STOP</b> key.</p>
<b>Listening to received messages</b>	<p><b>PLAYBACK</b></p> <p>For a personal box, enter the box number</p> <p>Enter passcode if necessary</p>
<b>Erasing received messages</b>	<p><b>General messages</b> (no passcode): Hold down <b>DELETE</b> key for 2 seconds.</p> <p><b>General messages</b> (passcode needed): Press <b>DELETE</b> and enter passcode.</p> <p><b>General messages:</b> Press <b>DELETE</b>, enter box number, and enter passcode if necessary.</p>

## CHAPTER 2. ADJUSTMENTS

### [1] Adjustments

#### General

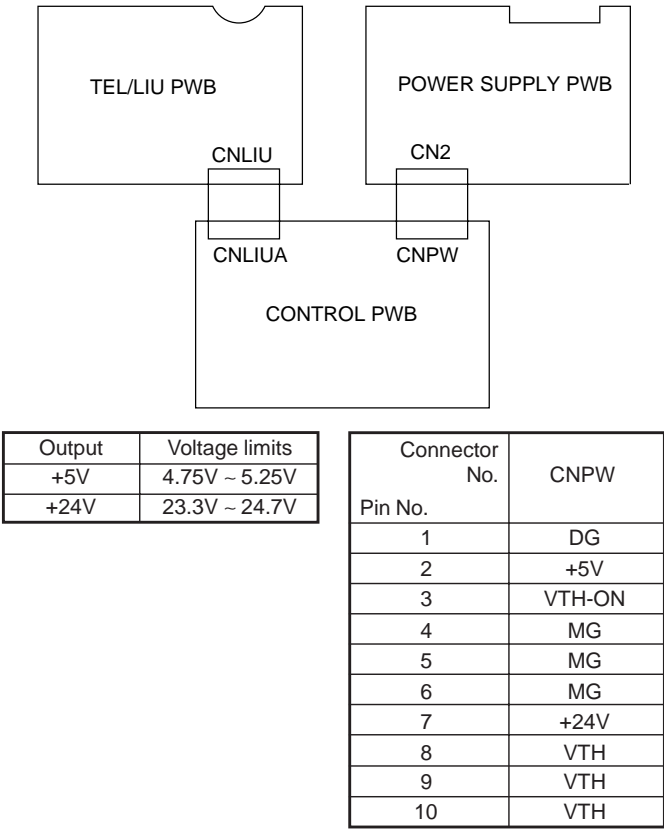
Since the following adjustments and settings are provided for this model, make adjustments and/or setup as necessary.

#### 1. Adjustments

##### Adjustments of output voltage (FACTORY ONLY)

1. Install the power supply unit in the machine.
2. Set the recording paper and document.
3. When the document is loaded, power is supplied to the output lines.  
Confirm that outputs are within the limits below.

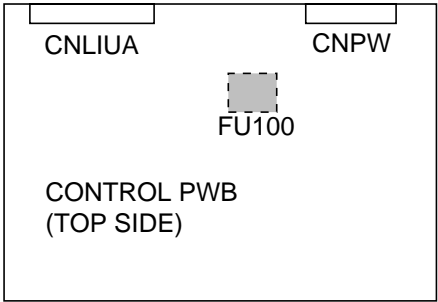
##### Output voltage settings



#### 2. IC protectors replacement

ICPs (IC Protectors) are installed to protect the motor driver circuit. ICPs protect various ICs and electronic circuits from an overcurrent condition.

The location of ICPs are shown below:



- (1) FU100 (ICP-S07) is installed in order to protect IC's from an over-current generated in the motor drive circuit. If FU100 is open, replace it with a new one.

#### 3. Settings

##### (1) Dial mode selector

DIAL mode (Soft Switch No. SWB4 DATA No. 3)

(step 1) Select "OPTION SETTING".

KEY : **FUNCTION** ④  
DISPLAY: **OPTION SETTING** ↔ **PRESS× OR #**

(step 2) Select "DIAL MODE".

KEY: **# # # # # # # # #**  
DISPLAY: **DIAL MODE** ↔ **1=TONE, 2=PULSE**

Cursor  
When initially registering,  
the mode shows 1=TONE.  
When registering again, the  
mode which was registered  
formerly is shown.

(step 3) Select, using "1" or "2".

KEY: **①**  
DISPLAY: **TONE SELECTED**

KEY: **②**  
DISPLAY: **PULSE SELECTED**

(step 4) End, using the "STOP" key.

KEY: **STOP**

#### 4. Method of release of starting lock up by Battery Reset

##### (1) Summary

There is a possibility of release of the lock up by reset the signal BATRST of CPU (FC100), if it lock up when you turn on the power of the set in UX-258 series. We inform you of the method of release.

##### (2) Contents

When you turn on the power of the set without EPROM by your mistake, if you turn off the power after, turn on the power with EPROM again, the set don't start.

In this case, before you judge the cpu (FC100) is wrong, you need to confirm the release of the lock up by reset the signal BATRST. and unknown origin in the same way.

##### Method of the reset of signal BATRST

Short the between leads of the capacitor C5 on the control PWB, X2961-81 in the state of POWER OFF.



3. Diagnostic items description

3. 1. Soft switch mode

Used to change the soft switch settings.

The soft switch which is stored internally is set by using the keys.

The available soft switches are SW-A1 to SW-L2.

The content of soft switches is shown in page 2-5 to 2-16.

The contents are set to factory default settings.

3. 2. ROM & RAM check

ROM executes the sum check, and RAM executes the matching test.

The result will be notified with the number of short sounds of the buzzer as well as by printing the ROM & RAM check list.

Number of short sounds of buzzer    0 → No error  
    1 → ROM error  
    2 → RAM error (32Kbyte)

3. 3. Aging mode

If any document is first present, copying will be executed sheet by sheet. If no document is present, the check pattern will be printed sheet by sheet. This operation will be executed at a rate of one sheet per 5minutes, and will be ended at a total of 10 sheets.

3. 4. Panel key test

The mode is used to check whether each key operates properly or not. Press the key on the operation panel, and the key will be displayed on the display. Therefore, press all keys. At this time, finally press the STOP key.

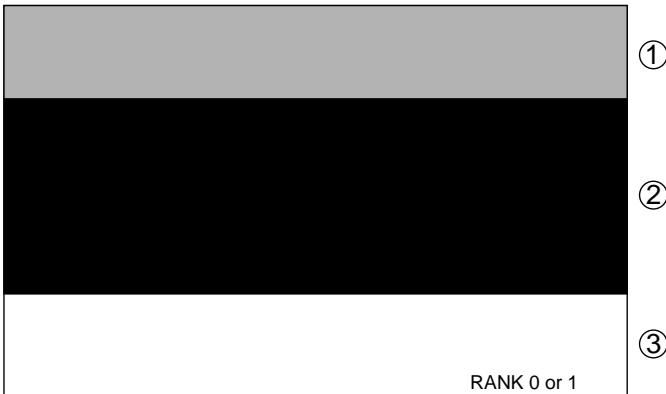
When the STOP key is pressed, the keys which are not judged as "pressed" will be printed on the result list.

- LED port of the contact image sensor (CIS) is kept on during the term from when start of the panel test mode to end with the STOP key.

3. 5. Check pattern mode

This mode is used to check the status of print head. Two sheets of check pattern are printed. The following information of check pattern is printed.

① Vertical stripes (alternate white and black lines)	Approx. 35 mm
② Full black	Approx. 70 mm
③ Full white	Approx. 35 mm



Note:

There is a selection RANK 0 or 1 depending on resistance value of the thermal head. RANK 0 or RANK 1 is printed at the tail of check pattern to identify.

3. 6. Signal send mode

The mode is used to send various signals to the circuit during FAX communication. Every push of START key sends a signal in the following sequence. Moreover, the signal sound is also output to the speaker when the line monitor of the soft switch is on.

- [1] No signal (CML signal turned on)
- [2] 9600bps
- [3] 7200bps
- [4] 4800bps
- [5] 2400bps
- [6] 300bps (FLAG)
- [7] 2100Hz (CED)
- [8] 1100Hz (CNG)
- [9] END

3. 7. Memory clear mode

This mode is used to clear the backup memory and reset to the default settings.

3. 8. Shading mode

The mode is used for the shooting compensation. For reading, set up the special original paper.

The shooting compensation memorizes the reference data of white and black for reading.

Moreover, the memorized data is not erased even if memory clear mode is executed.

3. 9. All black mode

The mode is used to check the state of the printing head and intentionally overheat it. Whole dots are printed over the interval of 2 m. If it is overheated or the printing sheet is jammed, press STOP key for the end.

3. 10. Auto feeder mode

In this mode, a document is inserted and discharged to check the auto feed function.

After this mode is started, set a document, and the document feed will be automatically tested.

3. 11. Entry data send

The mode is used to send the registered data to the other machine and make the other machine copy the registered content.

Before sending in this mode, it is necessary to set the other machine at the entry data receive mode.

The sent content is as follows. After printing is completed, the following lists are printed.

- 1. Telephone list data
- 2. Sender register data
- 3. Optional setting content
- 4. Soft switch content
- 5. Junk fax number list
- 6. Timer reservation data (only on the model which timer reservation is possible)
- 7. Recording setting list data

### 3. 12. Entry data receive

In this mode, the registered data sent from the other machine are received and the received data are registered in the own machine. When this mode is used for receiving, the other machine must be in the entry data send mode.

After receiving is completed, the following lists are printed.

1. Telephone list data
2. Sender register data (The passcode No. is also printed if the polling function is provided.)
3. Optional setting list
4. Soft switch content
5. Junk fax number list
6. Timer reservation list (only model which timer communication is possible)
7. Recording setting list data

### 3. 13. Flash memory check

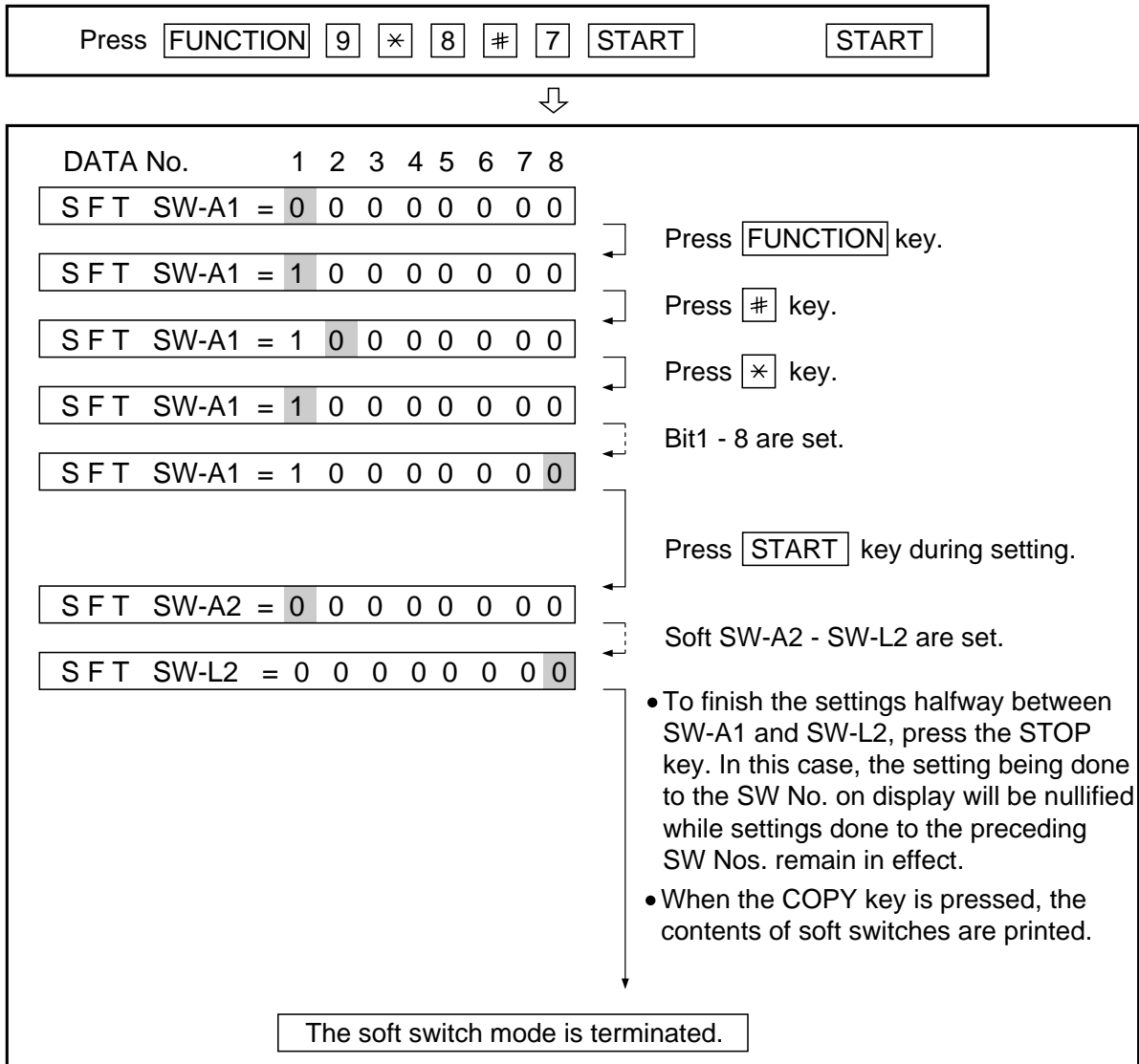
Data writing/read of flash memory is checked, and the result (OK/NG) is printed.

### 3. 14. Flash memory clear

All data of flash memory is cleared.  
The result of clear (OK/NG) is printed.

## 4. How to make soft switch setting

To enter the soft switch mode, make the following key entries in sequence.



## 5. Soft switch description

### • Soft switch

SW NO.	DATA NO.	ITEM	Switch setting and function				Initial setting	Remarks	
			1		0				
SW I A1	1	Protect from echo	No		Yes		0		
	2	Forced 4800 BPS reception	Yes		No		0		
	3	Footer print	Yes		No		0		
	4	Length limitation of copy/send/receive	No limit		Copy/send: 60cm Receive: 1.5m		0		
	5	CSI transmission	No transmitted		Transmitted		0		
	6	DIS receive acknowledgement during G3 transmission	Twice		NSF: Once DIS: Twice		0		
	7	Non-modulated carrier for V29 transmission modem	Yes		No		0		
	8	EOL detect timer	25 s		13 s		0		
SW I A2	1 2 3 4	Modem speed		V.29		V.27 ter		0 0 0 1	
				9600bps	7200bps	4800bps	2400bps		
			No. 1	0	0	0	0		
			No. 2	0	0	0	0		
			No. 3	0	1	1	0		
		No. 4	1	1	0	0			
	5	Sender's information transmit	No		Yes		0		
	6	H2 mode	No		Yes		0		
	7	Communication error treatment in RTN sending mode (reception)	No communication error		Communication error		0		
8	CNG transmission	No		Yes		0			
SW I A3	1 2	CED tone signal interval		1000ms	750ms	500ms	75ms	0 0	
			No. 1	1	1	0	0		
			No. 2	1	0	1	0		
	3	MR coding	No		Yes		0		
	4	Reserved					0		
	5	Reserved					0		
	6	Reserved					0		
	7	Reserved					0		
8	Reserved					0			
SW I A4	1	Signal transmission level	Binary input					0	
	2		No. = 16 8 4 2 1					0	
	3		1 2 3 4 5					1	
	4		0 0 1 0 0 (-8 dBm)					0	
	5							0	
6	Protocol monitor (error print)	Printed at com. err		Not printed		0			
7	Protocol monitor	Yes		No		0			
8	Line monitor	Yes		No		0			
SW I A5	1 2	Digital line equalization setting (Reception)		7.2km		0km		1 1	
			No. 1	1		0			
			No. 2	1		0			
	3	Reserved					0		
	4	Reserved					0		
	5	Reserved					0		
	6	Reserved					0		
	7	Error criterion	10 ~ 20 %		5 ~ 10 %		0		
8	Anti junk fax check	Yes		No		0	OPTION		



SW NO.	DATA NO.	ITEM	Switch setting and function		Initial setting	Remarks
			1	0		
SW   A6	1	Auto gain control (MODEM)	Enable	Disable	1	
	2	End Buzzer	Yes	No	1	
	3	Disconnect the line when DIS is received in RX mode	No	Yes	1	
	4	Equalizer freeze control (MODEM)	On	Off	0	
	5	Equalizer freeze control 7200 BPS only	No	Yes	0	
	6	CNG transmission in manual TX mode	Yes	No	1	
	7	Initial compression scheme for sharp fax in TX mode	MR mode	H2 mode	0	
	8	Reserved			0	
SW   B1	1	Recall interval	Binary input No. = 8 4 2 1 1 2 3 4 0 1 0 1 (5 x 60 sec = 5 min)		0	OPTION
	2				1	
	3				0	
	4				1	
	5	Recall times	Binary input No. = 8 4 2 1 5 6 7 8 0 0 1 0 (Twice)		0	OPTION
	6				0	
	7				1	
	8				0	
SW   B2	1	Dial pausing (sec/pause)	4 sec	2 sec	0	
	2	Reserved			0	
	3	Reserved			0	
	4	Busy tone detection (after auto dial)	No	Yes	1	
	5	Waiting time after dialing	90 sec	45 sec	0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW   B3	1	Reserved			0	
	2	Reserved			0	
	3	Reserved			0	
	4	Reserved			0	
	5	Reserved			0	
	6	Reserved			0	
	7	Reserved			0	
	8	Hold function	Enable	Disable	1	
SW   B4	1	Auto Dial Mode Delay timer of before line connect	3 sec	0 sec	1	
	2	Auto Dial Mode Delay timer of after line connect	3.6 sec	3 sec	0	
	3	Dial mode	Tone	Pulse	1	OPTION
	4	Pulse → Tone change function by ✕ key	Enable	Disable	1	
	5	Dial pulse make/break ratio (%)	40/60	33/67	1	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	
SW   B5	1	DTMF signal transmission level (Low)	Binary input No. = 16 8 4 2 1 1 2 3 4 5 0 1 0 1 0 (0.5 x 12 = -6 dBm)		0	
	2				1	
	3				0	
	4				1	
	5				0	
	6	Reserved			0	
	7	Reserved			0	
	8	Reserved			0	

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks
			1		0				
SW I B6	1	DTMF signal transmission level (High)	Binary input					0	
	2		No. = 16 8 4 2 1					0	
	3		1 2 3 4 5					1	
	4		0 0 1 1 0 (0.5 x 7 = -3.5 dBm)					1	
	5							0	
	6	Reserved						0	
	7	Reserved						0	
8	Reserved						0		
SW I C1	1 2	Reading slice (Binary)		Factory setting	Light	Dark	Darker in dark mode	0 0	
			No. 1	0	1	0	1		
			No. 2	0	0	1	1		
	3 4	Reading slice (Half tone)		Factory setting	Light	Dark	Darker in dark mode	0 0	
			No. 3	0	1	0	1		
			No. 4	0	0	1	1		
	5	Line density selection	Fine		Standard			0	OPTION
	6	Reserved						0	
	7	MTF correction in half tone mode	No		Yes			0	
	8	Reserved						0	
SW I D1	1	Number of rings for auto receive	Binary input					0	OPTION
	2		No. = 8 4 2 1					0	
	3		1 2 3 4					0	
	4		0 0 0 1 (4 times)					1	
	5	Automatic switching manual to auto receive mode	Reception after 5 rings		No reception			0	OPTION
	6	Reserved						0	
	7	Reserved						0	
8	Reserved						0		
SW I D2	1	Reserved						0	
	2	Reserved						0	
	3	Reserved						0	
	4	Reserved						0	
	5	Reserved						0	
	6 7	CI off detection timer (Distinctive ring setting off only)		1200ms	1000ms	700ms	350ms	0 1	
			No. 6	0	1	0	1		
			No. 7	0	0	1	1		
8	Reserved						0		
SW I E1	1	Tel/Fax Automatic switching mode	Enable		Disable			0	
	2 3	Pseudo ringing time at phone/fax automatic switching mode		15sec	60sec	30sec	120sec	0 0	OPTION
			No. 2	0	0	1	1		
			No. 3	0	1	0	1		
	4	Number of CNG signal detection at the phone/fax automatic switching mode	Twice		Once			1	
	5	CNG detect time at TEL/FAX mode	3 sec		5 sec			0	
	6	Reserved						0	
	7	Reserved						0	
8	Reserved						0		

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks	
			1		0					
SW I E2	1	Pseudo ringer sound output level to the line	Binary input					0		
	2		No. = 8 4 2 1					1		
	3		1 2 3 4					0		
	4		0 1 0 1 (-5 dBm -5 = -10 dBm)					1		
			(-5 ~ -20 dBm setting)							
	5	Reserved						0		
	6	Reserved						0		
	7	Reserved						0		
8	Reserved						0			
SW I F1		DTMF detection time		50ms	80ms	100ms	120ms	0		
	1		No. 1	0	0	1	1			
	2		No. 2	0	1	0	1			
	3	Protection of remote reception (5 ☒☒ ) detect	Yes			No			0	OPTION
	4	Remote reception with GE telephone	Compatible			Not compatible			1	
	5	Remote operation code figures by external TEL (0~9)	Binary input					0	OPTION	
	6		No. = 8 4 2 1					1		
	7		5 6 7 8					0		
8	0 1 0 1 (5 ☒☒ )					1				
SW I F2	1	CNG detection in STAND-BY mode	Yes			No			1	OPTION
		Number of CNG detect (AM mode)		1pulse	2pulses	3pulses	4pulses	0		
	2		No. 2	0	0	1	1			
	3		No. 3	0	1	0	1			
		Number of CNG (STAND-BY mode)		1pulse	2pulses	3pulses	4pulses	0		
	4		No. 4	0	0	1	1			
	5		No. 5	0	1	0	1			
	6	Fax signal detection after telephone mode dial	Yes			No			0	
	7	Reserved							0	
	8	Reserved							0	
SW I G1	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
SW I G2	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
SW I G3	1	Reserved							0	
	2	Reserved							0	
	3	Reserved							0	
	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks	
			1		0					
SW I H1	1	Busy tone detection ON/OFF time (Lower duration)	350ms		150ms			0		
	2	Busy tone detection ON/OFF time (Upper duration)	650ms		900ms			0		
	3	Reserved						0		
	4	Busy tone continuous sound detect time	5s		10s			1		
	5	Busy tone detect continuation sound detect during OGM	No		Yes			0		
	6	Busy tone detect continuation sound detect during ICM	No		Yes			0		
	7	Busy tone detect intermittent sound detect during OGM	No		Yes			0		
	8	Busy tone detect intermittent sound detect during ICM	No		Yes			0		
SW I H2	1	Busy tone detection pulse number		2pulses	4pulses	6pulses	10pulses	0		
			No. 1	0	0	1	1			
			No. 2	0	1	0	1			
	3	Fax switching when A.M. full	Yes			No			0	OPTION
	4	Busy tone detect continuation sound detect frequency	320 - 570 Hz			320 - 460 Hz			0	
	5	Reserved							0	
	6	Reserved							0	
	7	Reserved							0	
	8	Reserved							0	
SW I I1	1	ICM recording time		4min	15s	30s	60s	0	OPTION	
			No. 1	0	0	1	1			
			No. 2	0	1	0	1			
	3	A.M. quiet time 1		2S	3s	4s	5s	0		
			No. 3	0	0	1	1			
			No. 4	0	1	0	1			
	5	A.M. quiet time 2		0s	1s	2s	3s	1		
			No. 5	0	0	1	1			
			No. 6	0	1	0	1			
	7	Key input buzzer on/off switch (Two way recording mode)	On			Off			0	
	8	Reserved							0	
SW I I2	1	A.M. quiet detect time	Binary input					0		
	2		No. = 16 8 4 2 1					0		
	3		1 2 3 4 5					1		
	4		0 0 1 1 0 (6 sec)					1		
	5							0		
	6	Reserved							0	
	7	Reserved							0	
	8	Alarm during two way recording	Yes			No			0	

SW NO.	DATA NO.	ITEM	Switch setting and function					Initial setting	Remarks	
			1		0					
SW I I3	1	Max OGM record time	15s		60s			0		
	2	Reserved						0		
	3	Two way record function	Disable		Enable			0		
	4	Toll saver	Disable		Enable			0	OPTION	
	5	Reserved						0		
	6	Reserved						0		
	7	BOX selection to record ICM	2 digits DTMF		1digit DTMF			0		
	8	Transfer did recall	Disable		Enable			0		
SW I I4	1	AGC maximum gain (line) (10 ~ 25 dBm )	Binary input					1		
	2		No. = 8 4 2 1					1		
	3		1 2 3 4					0		
	4		1 1 0 1 (23 dB)					1		
	5	AGC maximum gain (Mic) (10 ~ 25 dBm )	Binary input					0		
	6		No. = 8 4 2 1					0		
	7		5 6 7 8					1		
	8		0 0 1 0 (12 dB)					0		
SW I I5	1	AGC eref access code (line) (-0 ~ -30 dBm with 2 dBm step)	Binary input					0		
	2		No. = 8 4 2 1					1		
	3		1 2 3 4					1		
	4		0 1 1 1 (-14 dB)					1		
	5	AGC eref access code (Mic) (-0 ~ -30 dBm with 2 dBm step)	Binary input					1		
	6		No. = 8 4 2 1					0		
	7		5 6 7 8					0		
	8		1 0 0 1 (-18 dB)					1		
SW I I6	1	AGC again adaptation threshold (line) (-40 ~ -70 dBm with 2 dBm step)	Binary input					1		
	2		No. = 8 4 2 1					1		
	3		1 2 3 4					1		
	4		1 1 1 1 (-70 dB)					1		
	5	AGC again adaptation threshold (Mic) (-40 ~ -70 dBm with 2 dBm step)	Binary input					0		
	6		No. = 8 4 2 1					1		
	7		5 6 7 8					0		
	8		0 1 0 1 (-50 dB)					1		
SW I I7	1	AGC slew rate (line)		Slow	Normal	Little fast	Fast	0		
			No. 1	0	0	1	1			
			No. 2	0	1	0	1			
	3	AGC slew rate (Mic)		Slow	Normal	Little fast	Fast	1		
			No. 3	0	0	1	1			
			No. 4	0	1	0	1			
	5	FAX BOX function	Disable			Enable			0	OPTION
	6	Frequency of voice detection after REMINDER dialing	800 Hz ~ 1400 Hz			800 Hz ~ 1200 Hz			0	
	7	Voice detection time after REMINDER dialing		100ms	200ms	300ms	400ms	0		
			No. 7	0	0	1	1			
No. 8			0	1	0	1				
SW I J1	1	Reserved							0	
	2	Reserved							0	
	3	Sender's phone number setting	Cannot change			Change allowed			0	
	4	Reserved							0	
	5	Reserved							0	
	6	Reserved							0	
	7	Ringer volume		Off	Low	Middle	High	1	OPTION	
			No. 7	0	0	1	1			
No. 8			0	1	0	1				
8							0			

SW NO.	DATA NO.	ITEM	Switch setting and function							Initial setting	Remarks
			1			0					
SW I J2	1	Reserved								0	
	2	Reserved								0	
	3	Polling key	Yes			NO				0	OPTION
	4	Reserved								0	
	5	Reserved								0	
	6	Speaker volume (5 stages)		Very Low	Low	Middle	High	Very High	0 1 0	OPTION	
			No. 6	0	0	0	0	1			
			No. 7	0	0	1	1	0			
No. 8			0	1	0	1	0				
SW I J3	1	Reserved								0	
	2	Reserved								0	
	3	Communication results printout (Transaction report)		Error/Timer	Send only	Always	No print	0 0	OPTION		
			No. 3	0	0	1	1				
			No. 4	0	1	0	1				
	5	Reserved								0	
	6	Reserved								0	
	7	Reserved								0	
8	Reserved								0		
SW I K1	1	Entering DIAG mode by pressing SPEED key	Yes			No				0	
	2	Reserved								0	
	3	Reserved								0	
	4	Reserved								0	
	5	Reserved								0	
	6	Reserved								0	
	7	Reserved								0	
	8	Reserved								0	
SW I L1	1	OGM / ICM output level	Binary input No. = 16 8 4 2 1 1 2 3 4 5 1 0 0 0 1 (-17 dBm)							1	
			0								
			0								
			0								
			1								
	6	Reserved								0	
	7	Reserved								0	
	8	Reserved								0	
SW I L2	1	Reserved								0	
	2	Reserved								0	
	3	Reserved								0	
	4	Reserved								0	
	5	Reserved								0	
	6	Reserved								0	
	7	Reserved								0	
	8	Reserved								0	



## • Soft switch function description

### SW-A1 No. 1 Protect from echo

Used to protect from echo in reception.

### SW-A1 No. 2 Forced 4800BPS reception

When line conditions warrant that receptions take place at 4800 BPS repeatedly.

It may improve the success of receptions by setting at 4800BPS.

This improve the receiving document quality and reduces handshake time due to fallback during training.

### SW-A1 No. 3 Footer print

When set to "1", the date of reception, the sender machine No., and the page No. are automatically recorded at the end of reception.

### SW-A1 No. 4 Length limitation of copy/send/receive

Used to set the maximum page length.

To avoid possible paper jam, the page length is normally limited to 0.6 meter for copy or transmit, and 1.5 meters for receive.

It is possible to set it to "No limit" to transmit a long document, such as a computer print form, etc. (In this case, the receiver must also be set to no limit.)

### SW-A1 No. 5 CSI transmission

(CSI TRANSMISSION) is a switch to set whether the machine sends or does not send the signal (CSI signal) informing its own telephone No. to the remote fax. machine when information is received. When "nonsending" is set, the telephone No. is not output on the remote transmitting machine if the remote transmitting machine has the function to display or print the telephone No. of receiving machine, using this CSI signal.

### SW-A1 No. 6 DIS receive acknowledgment during G3 transmission

Used to make a choice of whether reception of DIS (NSF) is acknowledged after receiving two DISs (NSFs) or receiving one DIS (two NSF). It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

### SW-A1 No. 7 Non-modulated carrier for V29 transmission modem

Though transmission of a non-modulated carrier is not required for transmission by the V29 modem according to the CCITT recommendation, it may be permitted to a send non-modulated carrier before the image signal to avoid and echo suppression problem. It may be useful for overseas communication to avoid an echo suppression problem, if set to 1.

### SW-A1 No. 8 EOL (End Of Line) detect timer

Used to make a choice of whether to use the 25-second or 13-second timer for detection of EOL.

This is effective to override communication failures with some facsimile models that have longer EOL detection.

### SW-A2 No. 1 ~ No. 4 Modem speed

Used to set determine the initial modem speed. The default is 9600BPS. It may be necessary to program it to a slower speed when frequent line fallback is encountered, in order to save the time required for fallback procedure.

### SW-A2 No. 5 Sender's information transmit

(SENDER'S INFORMATION TRANSMISSION) is a switch to set the function to print the content of HEADER PRINT described in the passcode list at the front end of receiver's original when original is sent to the remote machine.

If this switch is set to "NO", the HEADER PRINT is not output at the receiving machine.

### SW-A2 No. 6 H2 mode

Used to determine reception of H2 mode (15 sec transmission mode). When set to OFF, H2 mode reception is inhibited even though the transmitting machine has H2 mode function.

### SW-A2 No. 7 Communication error treatment in RTN sending mode (Reception)

Used to determine communication error treatment when RTN is sent by occurrence of a received image error in G3 reception. When it is set to "1", communication error is judged as no error.

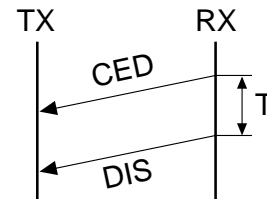
### SW-A2 No. 8 CNG transmission

When set to "0", this model allows CNG transmission by pressing the Start key in the key pad dialing mode. When set to "1", CNG transmission in the key pad dialing mode cannot be performed. In either case, CNG transmission can be performed in the auto dial mode.

### SW-A3 No. 1, No. 2 CED tone signal interval

For international communication, the 2100Hz CED tone may act as an echo suppression switch, causing a communication problem.

Though SW-A3 No. 1 and No. 2 are normally set to 0, it should be changed this time between the CED tone signal to eliminate the communication problem caused by echo.



### SW-A3 No. 3 MR Coding

Used to select the MR coding enable or disable.

### SW-A3 No. 4 ~ No. 8 Reserved

Set to "0".

### SW-A4 No. 1 ~ No. 5 Signal transmission level

Used to control the signal transmission level in the range of 0dB to -31dB.

The factory setting is at -8dB (MODEM output).

### SW-A4 No. 6 Protocol monitor (Error print)

If set to "1", protocol is printed at communication error.

### SW-A4 No. 7 Protocol monitor

Normally set to "0". If set to "1", communication can be checked, in case of troubles, without using a G3 tester or other tools.

When communication FSK data transmission or reception is made, the data is taken into the buffer. When communication is finished, the data is analyzed and printed out. When data is received with the line monitor (SW-A4 No. 8) set to "1" the reception level is also printed out.

### SW-A4 No. 8 Line monitor

Normally set to "0". If set to "1", the transmission speed and the reception level are displayed on the LCD. Used for line tests.

### SW-A5 No. 1, No. 2 Digital line equalization setting (Reception)

Line equalization when reception is to be set according to the line characteristics.

Setting should be made according to distance between the telephone and the telephone company central switching station.

### SW-A5 No. 3 ~ No. 6 Reserved

Set to "0".

### SW-A5 No. 7 Error criterion

Used to select error criterion for sending back RTN when receiving image data.

### SW-A5 No. 8 Anti junk fax check

When use the Anti junk fax function, set to "1".

### SW-A6 No. 1 Auto gain control (MODEM)

When this mode is enabled, if the reception signal level is under 31dBm. The modem itself controls the signal gain automatically.

#### SW-A6 No. 2 End buzzer

Setting this bit to 0 will disable the end buzzer (including the error buzzer/on-hook buzzer).

#### SW-A6 No. 3 Disconnect the line when DIS is received in RX mode

Bit1= 0: When DIS signal is received during RX mode, disconnected the line is immediately.

Bit1= 1: When DIS signal is received during RX mode, wait the next signal.

#### SW-A6 No. 4 Equalizer freeze control (MODEM)

This switch is used to perform reception operation by fixing the equalizer control of modem for the line which is always in unfavorable state and picture cannot be received.

\* Usually, the control is executed according to the state of line where the equalizer setting is changed always.

#### SW-A6 No. 5 Equalizer freeze control 7200BPS only

Setting which specifies SW-A3 No. 6 control only in the condition of 7200BPS modem speed.

#### SW-A6 No. 6 CNG transmission in manual TX mode

When set to "1", fax transmit the CNG signal in case of manual transmission mode (User press the START key after waiting the fax answering signal from handset or speaker).

#### SW-A6 No. 7 Initial compression scheme for sharp fax in TX mode

When set to "0", if the other fax is Sharp model, fax transmit the document by H2 mode. When set to "1", even if the other fax is Sharp model, fax transmit the document by MR mode.

#### SW-A6 No. 8 Reserved

Set to "0".

#### SW-B1 No. 1 ~ No. 4 Recall interval

Choice is made for a redial interval for speed and rapid dial calls. Used a binary number to program this. If set to 0 accidentally, 1 will be assumed.

#### SW-B1 No. 5 ~ No. 8 Recall times

Choice is made as to how many redials should be.

#### SW-B2 No. 1 Dialing pause (sec/pause)

Pauses can be inserted between telephone numbers of direct dial connection. Selection of 4 sec or 2 sec pause is available.

#### SW-B2 No. 2, No. 3 Reserved

Set to "0".

#### SW-B2 No. 4 Busy tone detection (after auto dial)

Used to set YES/NO of busy tone detection after auto dialing.

#### SW-B2 No. 5 Waiting time after dialing

This is waiting time for the opponent's signals after dialing.

When set to "0", waiting time is 45 sec.

When set to "1", waiting time is 90 sec.

#### SW-B2 No. 6 ~ No. 8 Reserved

Set to "0".

#### SW-B3 No. 1 ~ No. 7 Reserved

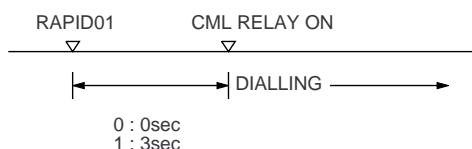
Set to "0".

#### SW-B3 No. 8 Hold function

Used to set YES/NO of holding function by the HOLD key.

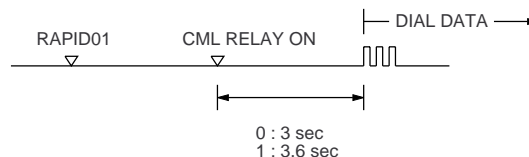
#### SW-B4 No. 1 Auto dial mode Delay timer of before line connect

Delay time between the dial key input and line connection under the auto dial mode.



#### SW-B4 No. 2 Auto dial mode Delay timer of after line connect

Delay time between the line connection and dial data output under the auto dial mode.



#### SW-B4 No. 3 Dial mode

When using the pulse dial, set to 0. When using the tone dial, set to 1.

SW-B4 No. 4 Pulse → Tone change function by ✕ key

When setting to 1, the mode is changed by pressing the ✕ key from the pulse dial mode to the tone dial mode.

#### SW-B4 No. 5 Dial pulse make/break ratio (%)

When using the 33 % make ratio pulse dial, set to "0".

When using the 40 % make ratio pulse dial, set to "1".

#### SW-B4 No. 6 ~ No. 8 Reserved

Set to "0".

#### SW-B5 No. 1 ~ No. 5 DTMF signal transmission level (Low)

The transmission level of DTMF signal is adjusted. (lower frequency)

00000: 0dBm

↓

11111: -15.5dBm (-0.5dBm x 31)

#### SW-B5 No. 6 ~ No. 8 Reserved

Set to "0".

#### SW-B6 No. 1 ~ No. 5 DTMF signal transmission level (High)

The transmission level of DTMF signal is adjusted. (higher frequency)

00000: 0dBm

↓

11111: -15.5 dBm (-0.5dBm x 31)

#### SW-B6 No. 6 ~ No. 8 Reserved

Set to "0".

#### SW-C1 No. 1, No. 2 Reading slice (Binary)

Used to determine the set value of reading density in standard/fine mode. The standard setting is "00" (Factory setting is "00")

#### SW-C1 No. 3, No. 4 Reading slice (Half tone)

Used to determine the set value of reading density in half tone mode. The standard setting is "00" (Factory setting is "00")

#### SW-C1 No. 5 Line density selection

Used to set the transmission mode which is automatically selected when the Resolution key is not pressed. In the copy mode, however, the fine mode is automatically selected unless the Resolution key is manually set to another mode.

#### SW-C1 No. 6 Reserved

Set to "0".

#### SW-C1 No. 7 MTF correction in half tone mode

This allows selection of MTF correction (dimness correction) in the half tone mode.

When "NO" (=1) is selected, the whole image becomes soft and mild. On the contrary, however, clearness of characters will be reduced. Normally set to "YES" (=0).

#### SW-C1 No. 8 Reserved

Set to "0".

#### SW-D1 No. 1 ~ No. 4 Number of rings for auto receive

When the machine is set in the auto receive mode, the number of rings before answering can be selected. It may be set from one to nine rings using a binary number. Since the facsimile telephone could be used as an ordinary telephone if the handset is taken off the hook, it should be programmed to the user's choice. If the soft switch was set to 1, direct connection is made to the facsimile. If a facsimile calling beep was heard when the handset is taken off the hook, press the START key and put the handset on the hook to have the facsimile start receiving. If it was set to 0 accidentally, receive ring is set to 1.

NOTE: If the machine is set to answer after a large number of rings, it may not be able to receive faxes successfully. If you have difficulty receiving faxes, reduce the number of rings to a maximum of 5.

#### SW-D1 No. 5 Automatic switching manual to auto receive mode

This soft switch is used to select whether the machine should switch to the auto receive mode after 5 rings in the manual receive mode or remain in the same way as SW-D1 No. 1, No. 2, No. 3 and No. 4 "0"1"0"1"(5 rings).

#### SW-D1 No. 6 ~ No. 8 Reserved

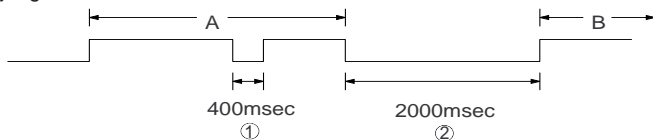
Set to "0".

#### SW-D2 No. 1 ~ No. 5 Reserved

Set to "0".

#### SW-D2 No. 6, No. 7 CI off detection timer (Distinctive ring setting off only)

Set the minimum time period of CI signal interruption which affords to be judged as a CI OFF section.



#### SW-D2 No. 8 Reserved

Set to "0".

#### SW-E1 No. 1 Tel/Fax Automatic switching mode

Used to set auto TEL/FAX switching mode or to set the normal fax mode.

#### SW-E1 No. 2, No. 3 Pseudo ringing time at the phone/fax automatic switching mode

Choice is made as to how long to rumble the dummy ringer on TEL/FAX automatic switching mode.

#### SW-E1 No. 4 Number of CNG signal detection at the phone/fax automatic switching mode

Used for detection of CNG in one tone or two tones in the TEL/FAX automatic switching mode.

#### SW-E1 No. 5 CNG detect time at TEL/FAX mode

The switch which sets the time from the start of CNG detection to the end of detection.

#### SW-E1 No. 6 ~ No. 8 Reserved

Set to "0".

#### SW-E2 No. 1 ~ No. 4 Pseudo ringer sound output level to the line

Used to adjust sound volume of pseudo ringer to the line (ring back tone) generated on selecting TEL/FAX. Setting is the reduce level from -5 dBm output level.

#### SW-E2 No. 5 ~ No. 8 Reserved

Set to "0".

#### SW-F1 No. 1, No. 2 DTMF detect time

Used to set detect time of DTMF (Dual Tone Multi Frequency) used in remote reception (5 × × ×).

The longer the detect time is, the less the error detection is caused by noises.

#### SW-F1 No. 3 Protection of remote reception (5 × × ×) detect

Used to set the function of remote reception (5 × × ×). When set to "1", the remote reception function is disabled.

#### SW-F1 No. 4 Remote reception with GE telephone

(Corresponding to TEL made by GE) P. B. X.

"1": Compatible with TEL mode by GE

"0": Not compatible

- When sending (5 × × ×) for remote reception with a GE manufactured telephone remote reception may not take place because of special specifications in their DTMF. To overcome this, a soft SW is provided to change the modem setting to allow for remote reception.
- If this soft SW is set to "1", other telephone sets may be adversely affected.

#### SW-F1 No. 5 ~ No. 8 Remote operation code figures by external TEL (0 ~ 9)

Remote operation codes can be changes from 0 through 9. If set to greater than 9, it defaults to 9. The "5 × × ×" is not changed.

Ex-7 × × × (Default: 5 × × ×)

#### SW-F2 No. 1 CNG detection in STAND-BY mode

When setting to "1", the CNG signal detection function during standby stops.

#### SW-F2 No. 2, No. 3 Number of CNG detect (AM mode)

Used for detection of CNG in 1 to 4 pulses.

#### SW-F2 No. 4, No. 5 Number of CNG (STAND-BY mode)

Used for detection of CNG in 1 to 4 pulses.

#### SW-F2 No. 6 Fax signal detection after telephone mode dial

When set to "1", if machine detect the fax answering signal after telephone calling (handset off-hook or speaker mode dial), machine start to receive the documents automatically.

#### SW-F2 No. 7, No. 8 Reserved

Set to "0".

#### SW-G1 No. 1 ~ No. 8 Reserved

Set to "0".

#### SW-G2 No. 1 ~ No. 8 Reserved

Set to "0".

#### SW-G3 No. 1 ~ No. 8 Reserved

Set to "0".

#### SW-H1 No. 1 Busy tone detection ON/OFF time (Lower duration)

The initial value of detection is set according to electric condition.

The set value is changed according to the local switch board. (Erroneous detection of sound is reduced.)

Normally the upper limit is set to 900msec, and the lower limit to 150msec.

If erroneous detection is caused by sound, etc., adjust the detection range.

The lower limit can be set in the range of 350msec to 150msec.

#### SW-H1 No. 2 Busy tone detection ON/OFF time (Upper duration)

Similarly to SW-H1 No. 1, the set value can be varied.

The upper limit can be set in the range of 650msec to 900msec.

SW-H1 No. 1	SW-H1 No. 2	Detection range
0	0	150msec ~ 900msec
0	1	150msec ~ 650msec
1	0	350msec ~ 900msec
1	1	350msec ~ 650msec

### SW-H1 No. 3 Reserved

Set to "0".

### SW-H1 No. 4 Busy tone continuous sound detect time

Set detecting time busy tone continuous sound for 5 seconds or 10 seconds.

### SW-H1 No. 5 Busy tone detect continuation sound detect during OGM

Used to detect the continuous tone of specific frequency during OGM output.

### SW-H1 No. 6 Busy tone detect continuation sound detect during ICM

Used to detect the continuous tone of specific frequency during ICM recording.

### SW-H1 No. 7 Busy tone detect intermittent sound detect during OGM

Used to detect the intermittent tone of specific frequency during OGM output.

### SW-H1 No. 8 Busy tone detect intermittent sound detect during ICM

Used to detect the intermittent tone of specific frequency during ICM recording.

### SW-H2 No. 1, No. 2 Busy tone detection pulse number

Used to set detection of Busy tone intermittent sounds.

### SW-H2 No. 3 Fax switching when A.M. full

If the answering machine's memory (tape) is full and there is no response, the machine automatically switches to Fax reception.

### SW-H2 No. 4 Busy tone detect continuation sound detect frequency

Set detecting frequency of busy tone continuation sound for 320 ~ 570 Hz or 320 ~ 460 Hz.

### SW-H2 No. 5 ~ No. 8 Reserved

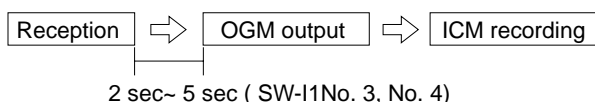
Set to "0".

### SW-I1 No. 1, No. 2 ICM recording time

Used to select the incoming message recording time among 15sec/30sec/60sec/4min.

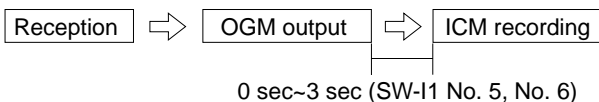
### SW-I1 No. 3, No. 4 A.M. quiet time 1

Used to select four kinds of no sound time (2 sec ~ 5 sec) after reception in the T. A. D mode until OGM is output.



### SW-I1 No. 5, No. 6 A.M. quiet time 2

Used to select four kinds of no sound time (0 sec ~ 3 sec) after OGM output the T. A. D mode until ICM recording is started.



### SW-I1 No. 7 key input buzzer on/off switch (Two way recording mode)

Used to turn ON/OFF key input buzzer in the TWO-WAY recording mode.

### SW-I1 No. 8 Reserved

Set to "0".

### SW-I2 No. 1 ~ No. 5 A.M. quiet detect time

Used to set no sound time (0 sec - 32 sec) during the T. A. D. mode operation.

### SW-I2 No. 6, No. 7 Reserved

Set to "0".

### SW-I2 No. 8 Alarm during two way recording

When set to "1", alarm sound is given to remote side during two way recording.

### SW-I3 No. 1 Max OGM record time

Used to select the maximum OGM recording time (1 = 15 sec, 0 = 60 sec).

### SW-I3 No. 2 Reserved

Set to "0".

### SW-I3 No. 3 Two way record function

If this switch is set to "1", machine doesn't work two way recording function.

### SW-I3 No. 4 Toll saver

Used to turn on the toll saver function. If it is off, the reception frequency in the AM mode is identical with that in the FAX mode.

### SW-I3 No. 5, No. 6 Reserved

Set to "0".

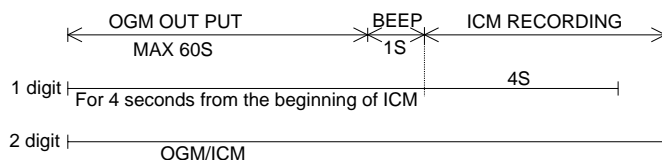
### SW-I3 No. 7 BOX selection to record ICM

This switch is selection to digit of BOX selection code (DTMF code).

1-digit: Input of box number (1-3)

2-digit: Input of box number (01-03)

Note: In case of 1-digit, the DTMF code can be accepted for 4 seconds from the beginning of ICM.



### SW-I3 No. 8 Transfer dial recall

If this switch is set to "1", machine disable redial in Transfer function.

### SW-I4 No. 1 ~ No. 4 AGC maximum gain (Line) (10~25dBm)

The AGC Maximum Gain limits the gain applied by the AGC. Message with average energy below the AGC Energy Reference Level will have their average energy level increased by no more than the AGC Maximum Gain. The AGC Maximum Gain should average energy of the message with the lowest average energy to the AGC Energy Reference Level.

### SW-I4 No. 5 ~ No. 8 AGC maximum gain (Mic) (10~25dBm)

The AGC Maximum Gain limits the gain applied by the AGC. Message with average energy below the AGC Energy Reference Level will have their average energy level increased by no more than the AGC Maximum Gain. The AGC Maximum Gain should average energy of the message with the lowest average energy to the AGC Energy Reference Level.

### SW-I5 No. 1 ~ No. 4 AGC eref access code (Line) (-0~-30dBm with 2dBm step)

The AGC Energy Reference Level controls the playback level. Any message having average speech energy above the energy reference level has its playback level attenuated, and any level has its playback level increased. If the playback level is too high (low), then decreasing (increasing) the AGC energy Reference level will achieve the desired level.

### SW-I5 No. 5 ~ No. 8 AGC eref access code (Mic) (-0~-30dBm with 2dBm step)

The AGC Energy Reference Level controls the playback level. Any message having average speech energy above the energy reference level has its playback level attenuated, and any level has its playback level increased. If the playback level is too high (low), then decreasing (increasing) the AGC energy Reference level will achieve the desired level.



**SW-I6 No. 1 ~ No. 4 AGC gain adaptation threshold (Line)**  
(-40~-70dBm with 2dBm step)

The AGC adjusts the amount of gain applied to the incoming message only when the average energy exceeds the AGC Gain Adaptation Threshold. The AGC Gain Adaptation Threshold prevents message background noise from corrupting the gain provided that the AGC Gain Adaptation Threshold is greater than the background noise energy. In the event that a message has background noise energy greater than the AGC Gain Adaptation Threshold, the AGC Gain can be no greater than the AGC Maximum Gain. Note that the AGC Gain Adaptation Threshold must always be greater than the RPACS VOX Turn-On Threshold).

**SW-I6 No. 5 ~ No. 8 AGC gain adaptation threshold (Mic)**  
(-40~-70dBm with 2dBm step)

The AGC adjusts the amount of gain applied to the incoming message only when the average energy exceeds the AGC Gain Adaptation Threshold. The AGC Gain Adaptation Threshold prevents message background noise from corrupting the gain provided that the AGC Gain Adaptation Threshold is greater than the background noise energy. In the event that a message has background noise energy greater than the AGC Gain Adaptation Threshold, the AGC Gain can be no greater than the AGC Maximum Gain. Note that the AGC Gain Adaptation Threshold must always be greater than the RPACS VOX Turn-On Threshold.

**SW-I7 No. 1, No. 2 AGC slew rate (Line)**

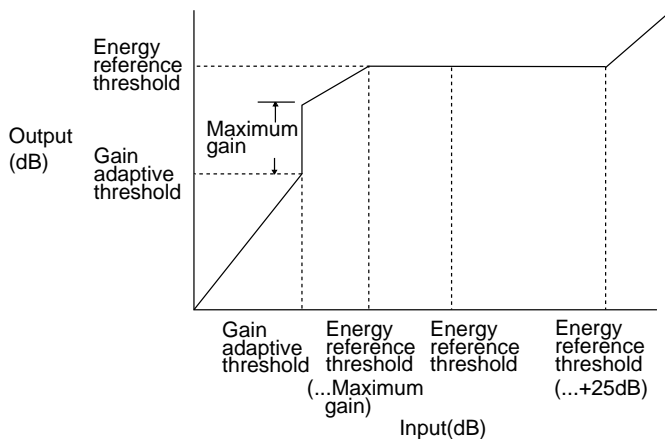
The AGC Slew Rate controls the convergence of the message playback level to the desired playback level. A large slew rate will allow faster convergence and a small slew rate will allow slower convergence.

**SW-I7 No. 3, No. 4 AGC slew rate (Mic)**

The AGC Slew Rate controls the convergence of the message playback level to the desired playback level. A large slew rate will allow faster convergence and a small slew rate will allow slower convergence.

**SW-I7 No. 5 FAX BOX function**

FAX BOX function YES/NO is set.



RPACS AGC Parameter operation envelope

**SW-I7 No. 6 Frequency of voice detection after REMINDER dialing**

When reminder calling, machine will detect the voice signal and start to send the reminder voice message. This switch is used to select the voice detecting frequency range.

When set to "0", machine detect the 800 ~ 1200 Hz as voice.

When set to "1", machine detect the 800 ~ 1400 Hz as voice.

**SW-I7 No. 7, No. 8 Voice detection time after REMINDER dialing**

This switch is used how long time coming voice frequency is judged as voice.

**SW-J1 No. 1, No. 2 Reserved**

Set to "0".

**SW-J1 No. 3 Sender's phone number setting**

Used to make a choice of whether the registered sender's phone number can be changed or not. If the switch is set to "1", new registration of the sender's phone number is disabled to prevent accidental wrong input.

**SW-J1 No. 4 ~ No. 6 Reserved**

Set to "0".

**SW-J1 No. 7, No. 8 Ringer volume**

Used to adjust ringing volume.

**SW-J2 No. 1, No. 2 Reserved**

Set to "0".

**SW-J2 No. 3 Polling key**

If this switch is set to 1, the last of Rapid key works as polling key.

**SW-J2 No. 4, No. 5 Reserved**

Set to "0".

**SW-J2 No. 6 ~ No. 8 Speaker volume (5 stages)**

Used to adjust sound volume from a speaker.

**SW-J3 No. 1, No. 2 Reserved**

Set to "0".

**SW-J3 No. 3, No. 4 Communication result printout (Transaction report)**

It is possible to obtain transaction results after each communication. Normally, the switch is set (No. 1: 0, No. 2: 0) so that the transaction report is produced only when a communication error is encountered. If No. 1 was set to 1 and No. 2 to 0, the transaction report will be produced every time a communication is done, even if the communication was successful.

Setting No. 1 to 1 and No. 2 to 1 will disable this function. No transaction report printed.

**SW-J3 No. 5 ~ No. 8 Reserved**

Set to "0".

**SW-K1 No. 1 Entering DIAG mode by pressing SPEED key**

A bit which is used in the production process only. When the SPEED key is pressed, the switch is changed from the stand-by state to the DIAG mode.

**SW-K1 No. 2 ~ No. 8 Reserved**

Set to "0".

**SW-L1 No. 1 ~ No. 5 OGM/ICM output level**

Used to control OGM and ICM output level.

**SW-L1 No. 6 ~ No. 8 Reserved**

Set to "0".

**SW-L2 No. 1 ~ No. 8 Reserved**

Set to "0".

[3] Troubleshooting

Refer to the following actions to troubleshoot any of problems mentioned in 1-4.

[1] A communication error occurs.

[2] Image distortion produced.

[3] Unable to do overseas communication.

[4] Communication speed slow due to FALLBACK.

- Increase the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5.  
May be used in case [1] [2] [3].
- Decrease the transmission level SOFT SWITCH A4-1, 2, 3, 4, 5. May be used in case [3].

- Apply line equalization SOFT SWITCH A5-1, 2.  
May be used in case [1] [2] [3] [4].
- Slow down the transmission speed SOFT SWITCH A2-1, 2, 3, 4. May be used in case [2] [3].
- Replace the TEL/LIU PWB.  
May be used in all cases.
- Replace the control PWB.  
May be used in all cases.

\* If transmission problems still exist on the machine, use the following format and check the related matters.

TO:	ATT:	Ref.No. :
CC:	ATT:	Date :
FM:		Dept :
		Sign :

***** Facsimile communication problem *****				Ref.No.:		
From: Mr.		Fax Tel No.:		Date:		
Our customer	Name			Tel No.		
	Address			Fax No.		
	Contact person			Model name		
Other party	Name			Tel No.		
	Address			Fax No.		
	Contact person			Model name		
Problem mode	Line: Domestic / international		Model: G3		Phase: A, B, C, D.	
	Reception / Transmission		Automatic reception / Manual reception			
			Automatic dialing / Manual dialing / Others			
Frequency:		%		ROM version:		
Confirmation item					Please mark problem with an X. No problem is: 0.	
					A1 A2 B1 B2 C1 C2 D1 D2 E1 E2	
					Transmission level setting is ( ) dB at our customer	
					Transmission level ( ) dBm	
					Reception level ( ) dBm	
By level meter at B1 and B2						
Comment						
Countermeasure						
**** Please attach the G3 data and activity report on problem. ****						

\* Please complete this report before calling the "TAC" hotline if problem still occurs.



## [4] Error code table

### 1. Communication error code table

#### G3 Transmission

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSF, DIS	Cannot recognize DCS signal by echo etc. Cannot recognize NSS signal (FIF code etc)
2	CFR	Disconnects line during reception (carrier missing etc)
3	FTT	Disconnects line by fall back
4	MCF	Disconnects line during reception of multi page Cannot recognize NSS, DCS signal in the case of mode change
5	PIP or PIN	The line is hung up without replying to telephone request from the receiving party.
6	RTN or RTP	Cannot recognize NSS, DCS signal after transmit RTN or RTP signal.
7	No signal or DCN	No response in receiver side or DCN signal received* (transmitter side)
8	–	Owing to error in some page the error could not be corrected although the specified number of error retransmission was attempted.
11	–	Error occurred after or while reception by the remote (receiving) machine was revealed to be impossible.
12	–	Error occurred just after fallback.
13	–	Error occurred after a response to retransmission end command was received.

#### G3 Reception

Code	Final received signal	Error Condition (Receiver side)
0	Incomplete signal frame	Cannot recognize bit stream after flag
1	NSS, DCS	Cannot recognize CFR or FTT signal Disconnects line during transmission (line error)
2	NSC, DTC	Cannot recognize NSS signal (FIF code etc)
3	EOP	Cannot recognize MCF, PIP, PIN, RTN, RTP signal
4	EOM	Cannot recognize MCF, PIP, PIN, RTN, RTP signal in the case of mode change
5	MPS	The line is hung up without replying to communication request.
6	PR1-Q	Cannot recognize PIP, PIN signal in the case of TALK request
7	No signal or DCN	No response in transmitter (cannot recognize DIS signal) or DCN signal received* (receiver side)
8	–	Error occurred upon completion of reception of all pages.
9	–	Error occurred when mode was changed or Transmission/Reception switching was performed.
10	–	Error occurred during partial page or physical page reception.
11	–	Error occurred after or during inquiry from the remote (transmitting) machine as to whether reception is possible or not.
12	–	Error occurred during or just after fallback.
13	–	Error occurred after the retransmission end command was received.

CHAPTER 3. MECHANISM BLOCKS

[1] General description

1. Document feed block and diagram

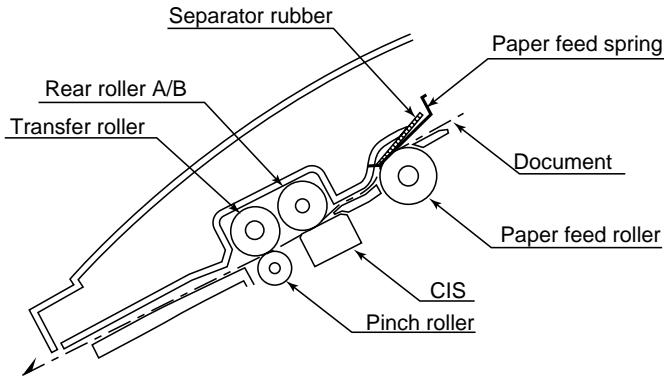


Fig. 1

2. Document feed operation

- 1) The document placed in the hopper actuates the document sensor. After one second, the pulse motor starts to drive the paper feed roller. The document is automatically taken up into the machine, and stopped at the document sensor.
- 2) When a specified number of pulses are received from the document sensor after the document lead edge is sensed, scanning is started.
- 3) When a specified number of pulses are received from the document sensor after the document rear edge is sensed, scanning is terminated and the document is fed through.
- 4) If the document sensor is active (i.e., another document is in the hopper), when the preceding document scanning is completed and it is fed out, the next document is taken up into the machine. If the document sensor is not active (i.e., there is no document in the hopper), when the document is fed out, the operation is terminated.

3. Hopper mechanism

3-1. General view

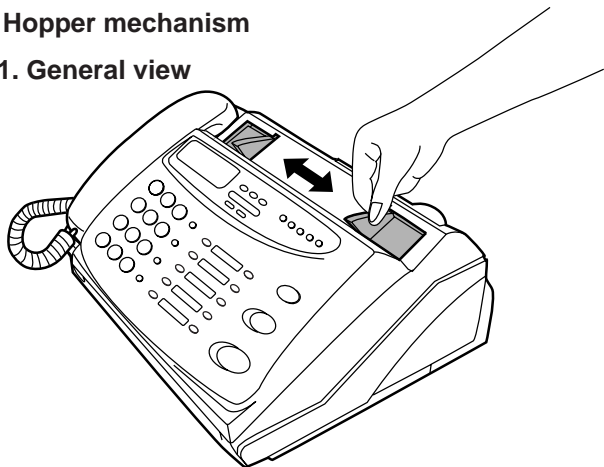


Fig. 2

The hopper is used to align documents with the document guides adjusted to the paper width.  
NOTE: Adjust the document guide after setting up the document.

3-2. Automatic document feed

- 1) Use of the paper feed roller and separation rubber plate ensures error-free transport and separation of documents. The plate spring presses the document to the paper feed roller to assure smooth feeding of the document.
- 2) Document separation method: Separation rubber plate

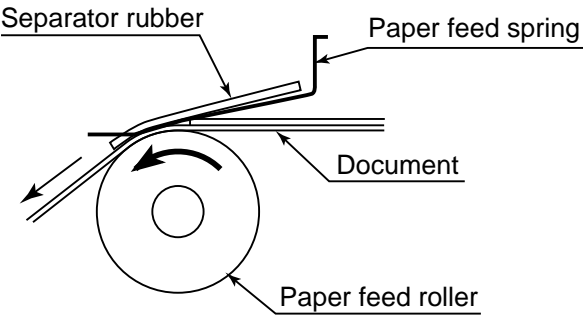


Fig. 3

3-3. Documents applicable for automatic feed

	4x6 series (788mm x 1091mm x 1000mm sheets)		Square meter series	
	Minimum	Maximum	Minimum	Maximum
Feeder capacity	10 sheets, max.			
Paper weight	45kg	64.3kg	52g/m <sup>2</sup>	74.3g/m <sup>2</sup>
Paper thickness (ref.)	0.06mm	0.09mm	0.06mm	0.09mm
Paper size	1/2 Letter (148mm x 140mm) ~ A4 (210mm x 297mm), Letter (216mm x 279mm)			

NOTE: Double-side coated documents and documents on facsimile recording paper should be inserted manually. The document feed quantity may be changed according to the document thickness.

Documents corresponding to a paper weight heavier than 64.3kg (74.3g/m<sup>2</sup>) and lighter than 135kg (157g/m<sup>2</sup>) are acceptable for manual feed.

Documents heavier than 135kg in terms of the paper weight must be duplicated on a copier to make it operative in the facsimile.

3-4. Loading the documents

- 1) Make sure that the documents are of suitable size and thickness, and free from creases, folds, curls, wet glue, wet ink, clips, staples and pins.
- 2) Place documents face down in the hopper.
  - i) Adjust the document guides to the document size.
  - ii) Align the top edge of documents and gently place them into the hopper. The first page under the stack will be taken up by the feed roller to get ready for transmission.

- NOTES:
- 1) Curled edge of documents, if any, must be straighten out.
  - 2) Do not load the documents of different sizes and/or thicknesses together.

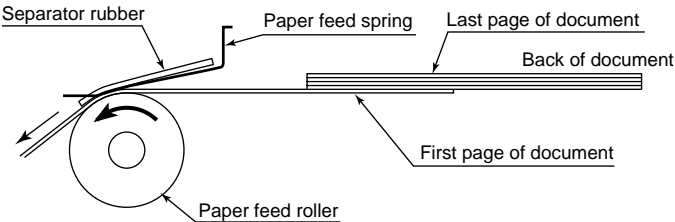


Fig. 4

### 3-5. Documents requiring use of document carrier

- 1) Documents smaller than B6 (128mm x 182mm).
- 2) Documents thinner than the thickness of 0.06mm.
- 3) Documents containing creases, folds, or curls, especially those whose surface is curled (maximum allowable curl is 5mm).
- 4) Documents containing tears.
- 5) Carbon-backed documents. (Insert a white sheet of paper between the carbon back and the document carrier to avoid transfer of carbon to the carrier.)
- 6) Documents containing an easily separable writing material (e.g., those written with a lead pencil).
- 7) Transparent documents.
- 8) Folded or glued documents.

Document in document carrier should be inserted manually into the feeder.

### 4. Document release

#### 4-1. General

When the release lever is pulled by hand in the direction of arrow, the latch is released and the upper document guide moves on its axis in the direction of the arrow. The feed rollers, the separation rubber plate, and the pinch rollers become free to make it possible to remove the document.

#### 4-2. Cross section view

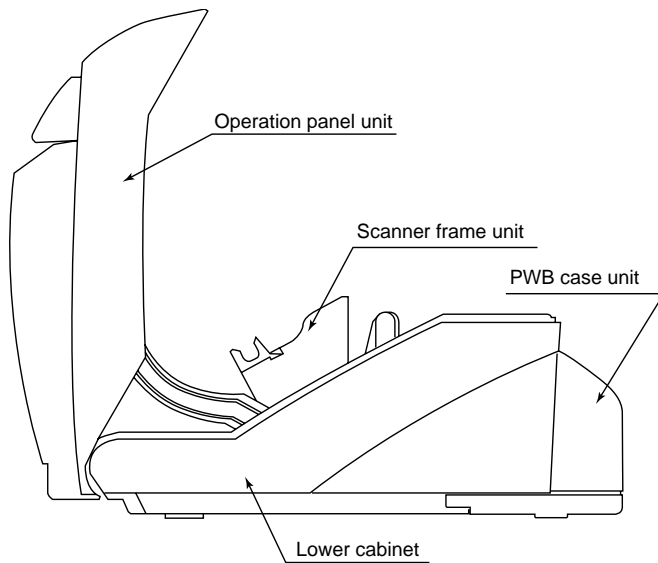


Fig. 5

### 5. Recording block

#### 5-1. General view

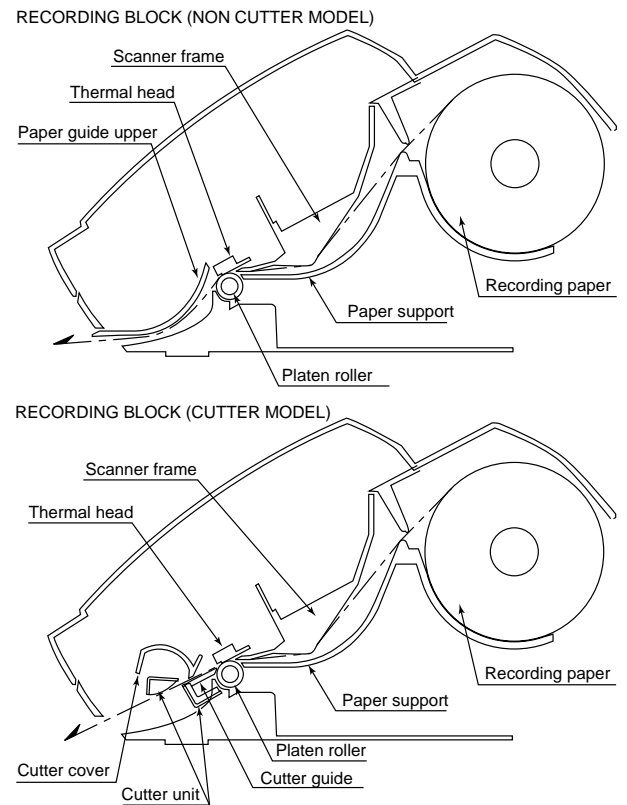


Fig. 6

#### 5-2. Driving

Via the pulse motor gear shaft, the reduction gear, and the recording paper feed gear, rotation of the pulse motor is conveyed to the recording paper feed roller to feed the recording paper.

#### 5-3. Recording

Use of a thermal head permits easier maintenance and low operating costs.

##### 1) Thermal head

The thermal head consists of 1728-dot heat elements arranged in a single row and has the resolution of 8 dots/mm. The maximum recording speed is 10ms/line. The thermal head also incorporates a 1728-dot shift register latch and output control driver circuit. Low power consumption is achieved by dividing the head into nine segments.

##### 2) Structure of the recording mechanism

Recording is accomplished by pressing the thermal head on the recording paper against the platen roller.

The main scan (horizontal) is electronically achieved, while the subscan (vertical) is achieved by moving the recording paper by the recording platen roller.

Usually, the cause for uneven print tone is caused by misalignment of the thermal head or uneven contact with the roller.

It can be checked in the following manner.

- 1) Check if the thermal head power and signal cables are properly routed.
- 2) Check that the thermal head pivot moves smoothly up and down.
- 3) Check that the thermal head support bracket is secured without any play.
- 4) Check to see that the recording platen roller has proper concentricity, in the case of a print tone variation evenly repeated down the page.
- 5) Replace the thermal head with a new one and check to see if the same trouble occurs.

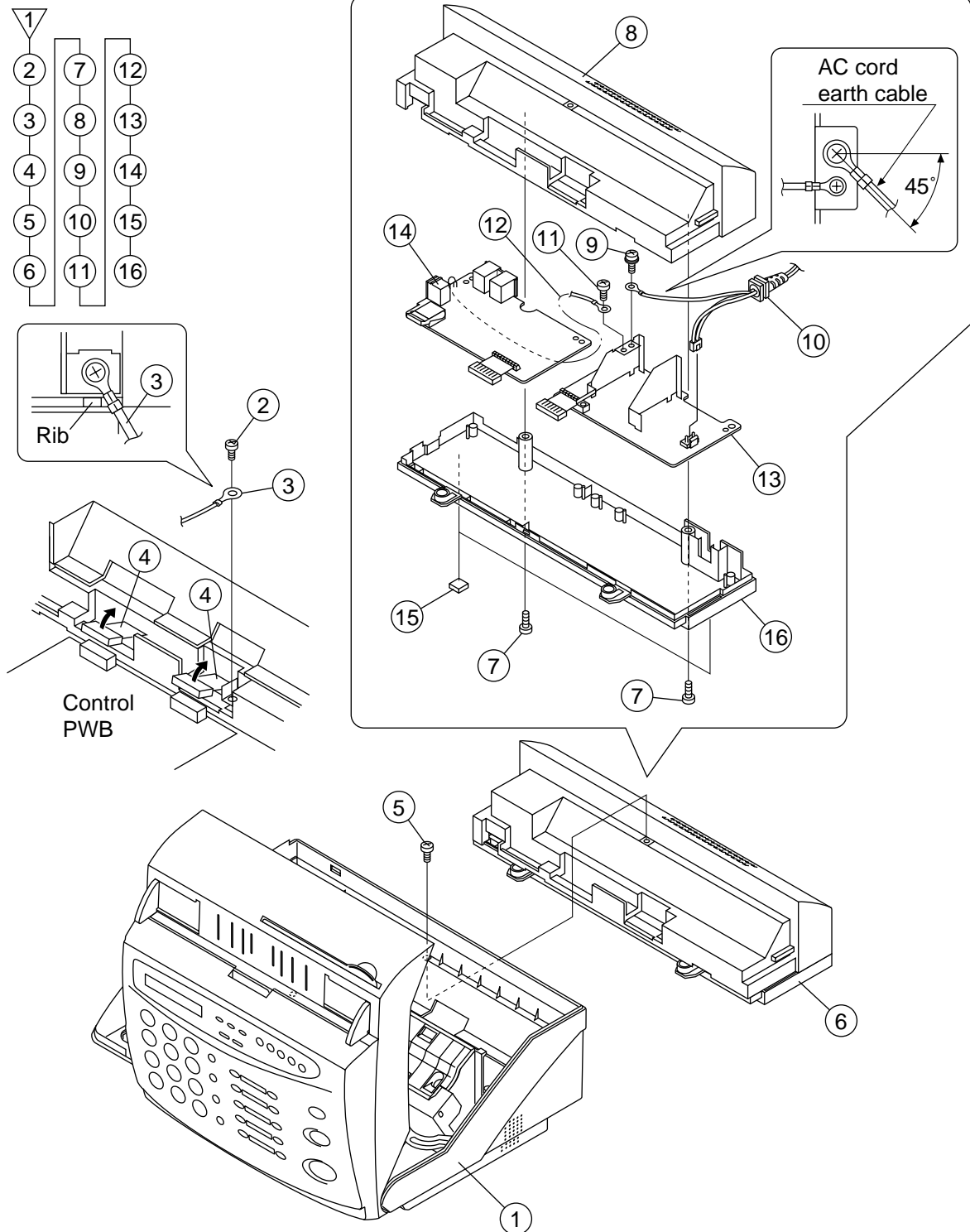


2

PWB case top, bottom and PWB

Parts list (Fig. 2)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	9	Screw (4×6)	1
2	Screw (3×6)	1	10	AC cord ass'y	1
3	Head earth cable	1	11	Screw (3×6)	1
4	Connector	2	12	TEL ARG cable	1
5	Screw (3×10)	1	13	Power supply PWB unit	1
6	PWB case unit	1	14	TEL/LIU PWB unit	1
7	Screw (3×10)	2	15	Rubber leg	2
8	PWB case, top	1	16	PWB case, bottom	1



3      Operation panel unit and scanner frame

Parts list (Fig. 3)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	9	Feed roller	1
2	Screw (3×10)	2	10	CIS cable	1
3	Scanner frame unit	1	11	CIS support, right	1
4	Document guide lower	1	12	CIS unit	1
5	Reduction gear, 17/36Z	1	13	CIS support, left	1
6	Reduction gear, 17/21Z	1	14	CIS spring	2
7	Idler gear, 25Z	1	15	Scanner frame	1
8	Feed roller shaft	1	16	Panel and head cable	2
			17	Operation panel unit	1

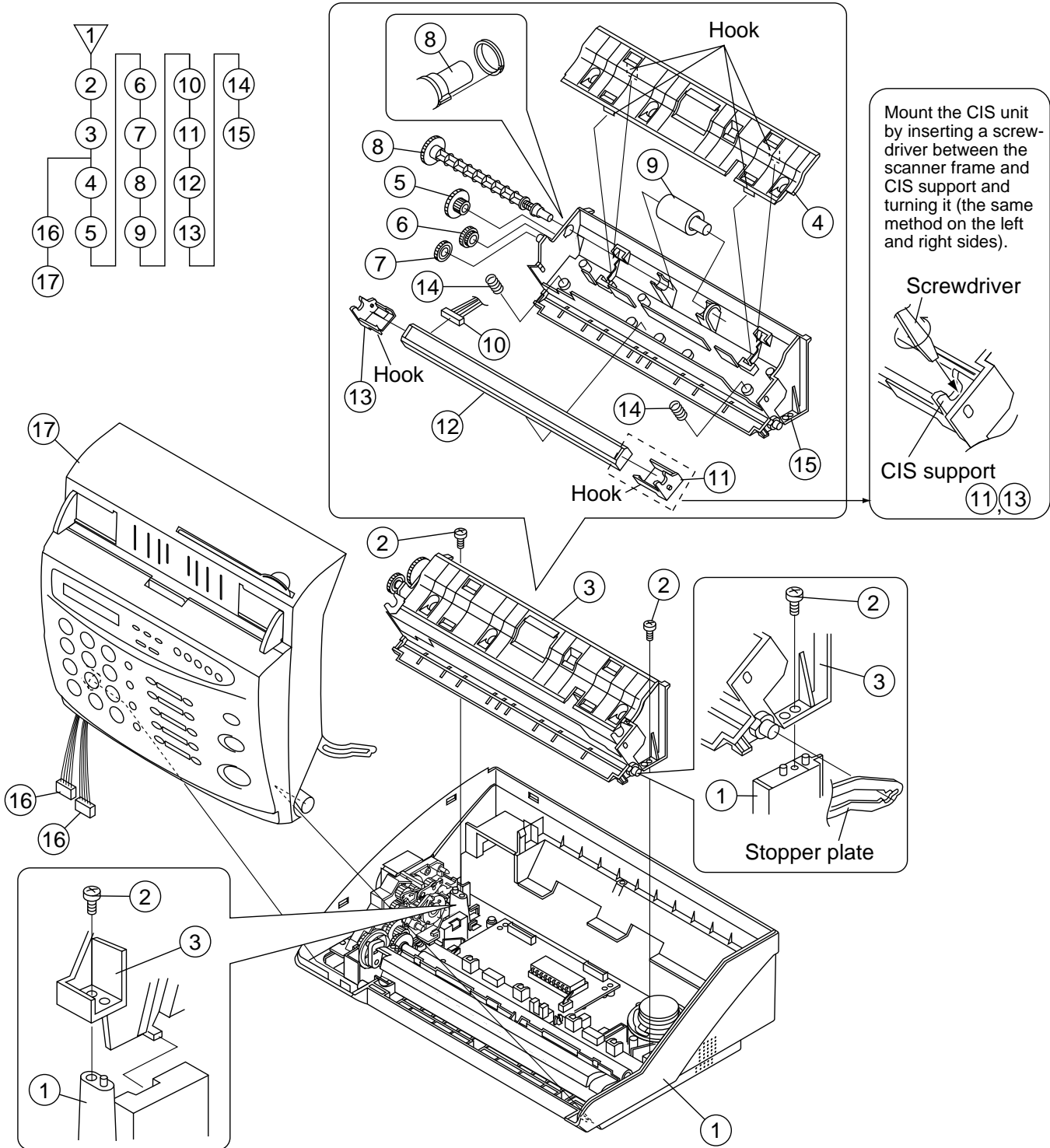


Fig. 3



4

# Document guide upper unit and head frame

Parts list (Fig. 4)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Operation panel unit	1	11	Head support, right	1
2	Screw (3×10)	2	12	Screw (3×6)	1
3	Support plate	1	13	Head earth cable	1
4	Document guide upper unit	1	14	Head support, left	1
5	Screw (3×10)	2	15	Thermal head	1
6	Head sheet	1	16	Pinch roller shaft	1
7	Head cable	1	17	Pinch roller	2
8	Head spring A	2	18	Pinch roller pressing spring	2
9	Head spring B	3	19	Head frame	1
10	Screw (3×6)	1			

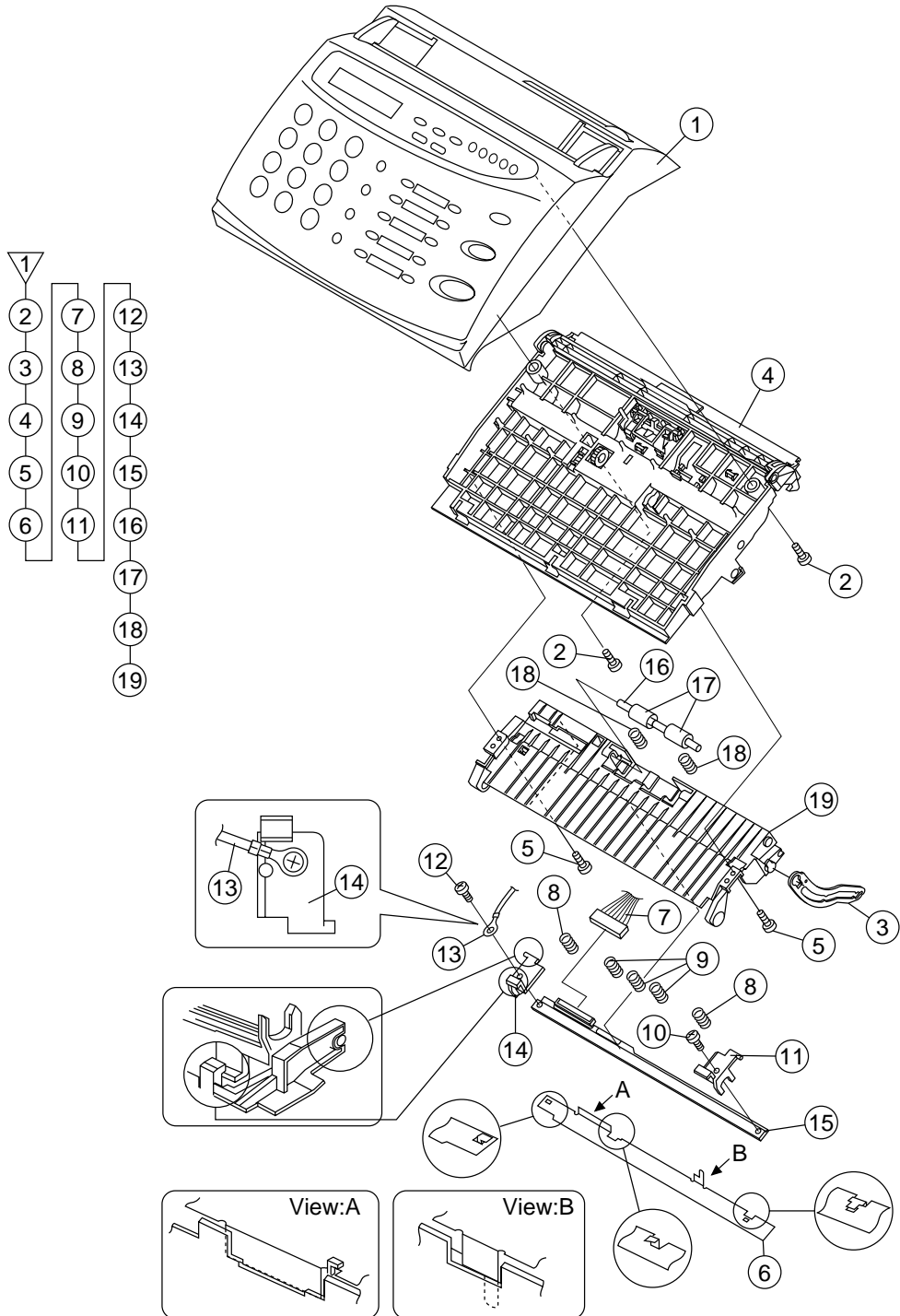


Fig. 4

5 Document guide upper

Parts list (Fig. 5)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Rear sheet	1	10	Panel lock lever	1
2	CIS gear, 29Z	1	11	Document sensor lever spring	1
3	CIS roller A ass'y	1	12	Document sensor lever	1
4	Transfer bearing	1	13	Separate spring	1
5	CIS roller B ass'y	1	14	Separator plate	1
6	Transfer roller	1	15	Paper feed spring	1
7	Transfer bearing	1	16	Separator rubber	1
8	Idler gear, 20Z	1	17	Document guide upper	1
9	Panel lock lever spring	1			

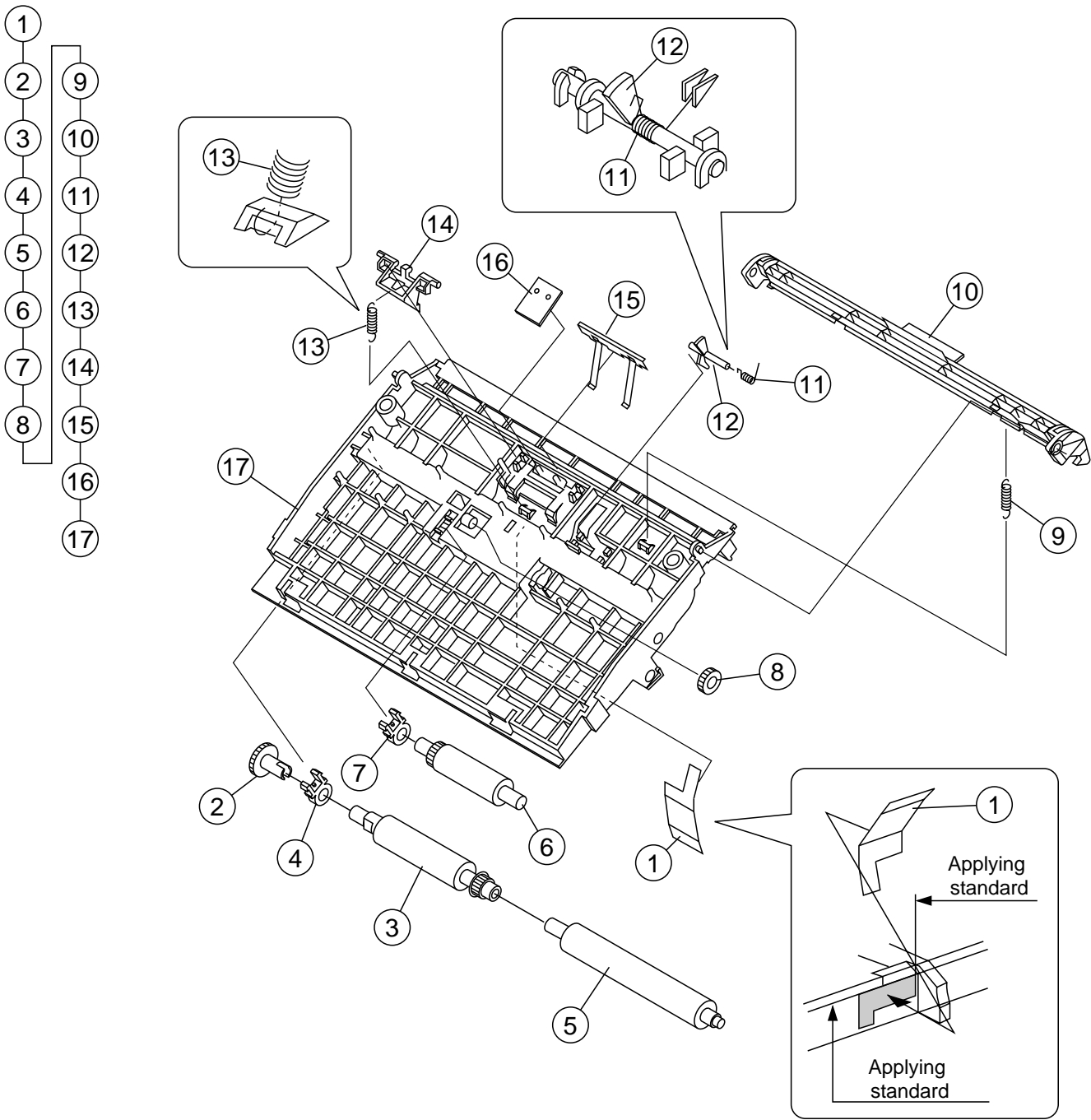


Fig. 5

6

Operation panel

Parts list (Fig. 6)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Operation panel unit	1	9	Hopper guide, right	1
2	Screw (2x6)	3	10	Hopper guide, left	1
3	Operation panel cable	1	11	TAD key	1
4	Operation panel PWB	1	12	Stop key	1
5	Document tray	1	13	Start key	1
6	Screw	1	14	Direct key	1
7	Pinion gear	1	15	12 key	1
8	Hopper spring	1	16	Operation panel	1

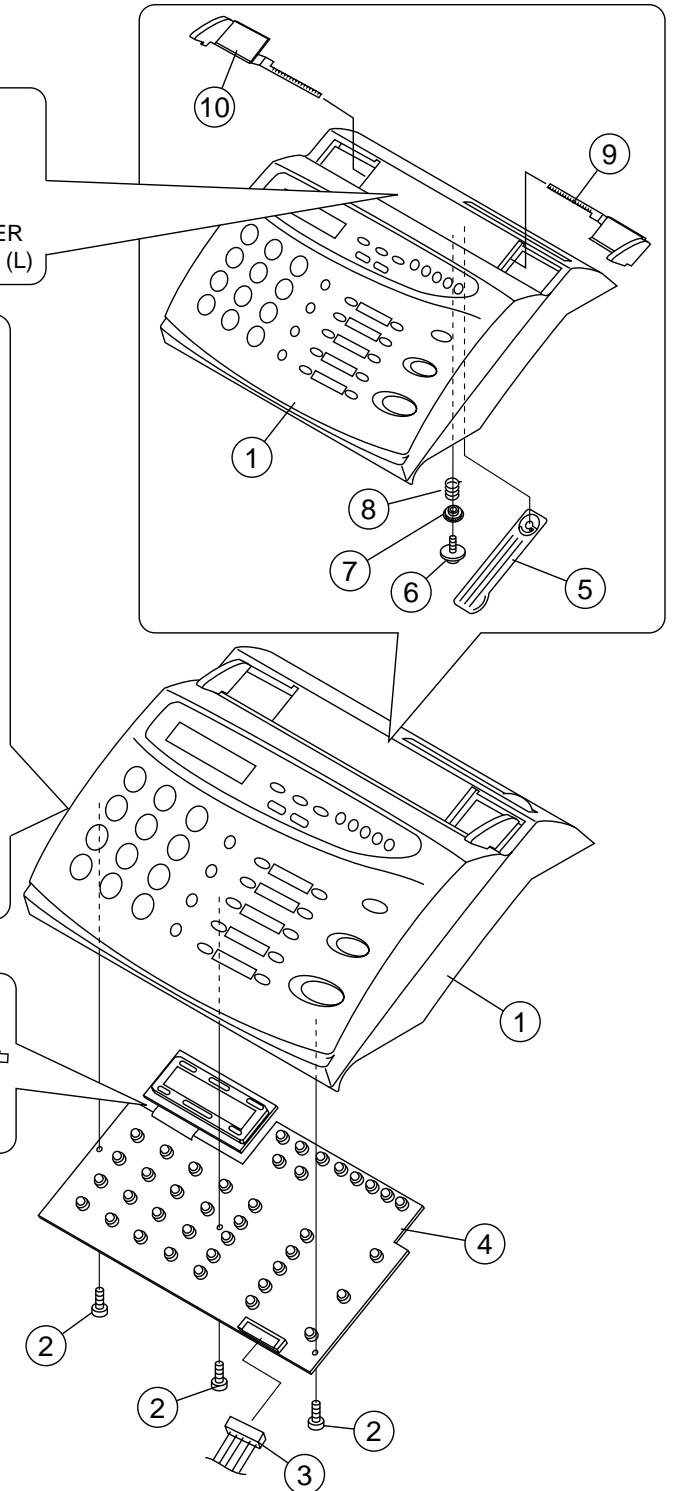
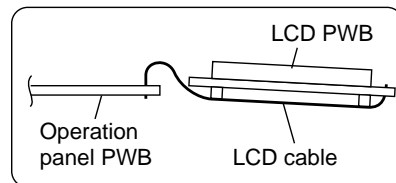
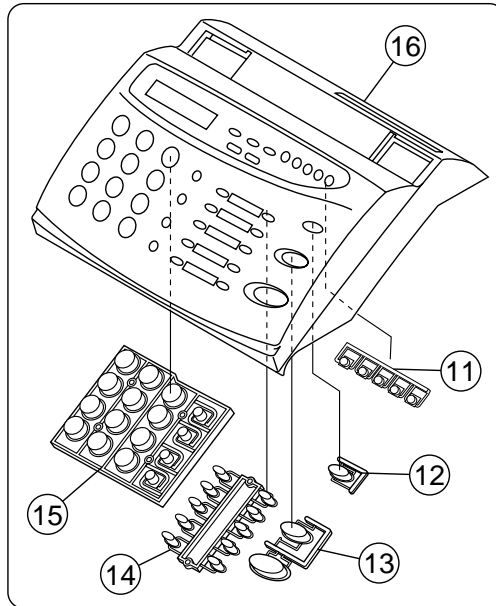
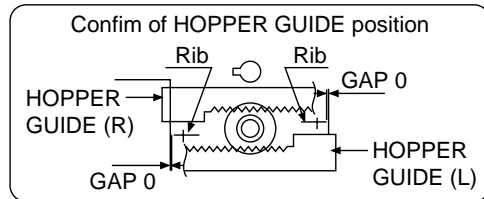
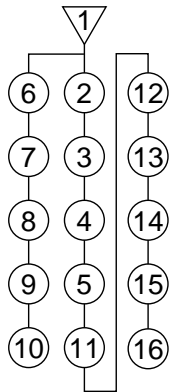


Fig. 6

7 Drive unit, PWB and cutter

Parts list (Fig. 7)

No.	Part name	Q'ty	No.	Part name	Q'ty
1	Mechanism unit	1	9	Cutter unit	1
2	Screw (3×10)	2	10	Screw (3×10)	1
3	Cutter arm	1	11	Cutter cover	1
4	Drive unit	1	12	Cutter guide	1
5	Platen gear	1	13	Cutter	1
6	Platen roller	1	14	Screw (3×10)	2
7	Platen bearing	2	15	Speaker cable	1
8	Screw (3×10)	1	16	Control PWB unit	1

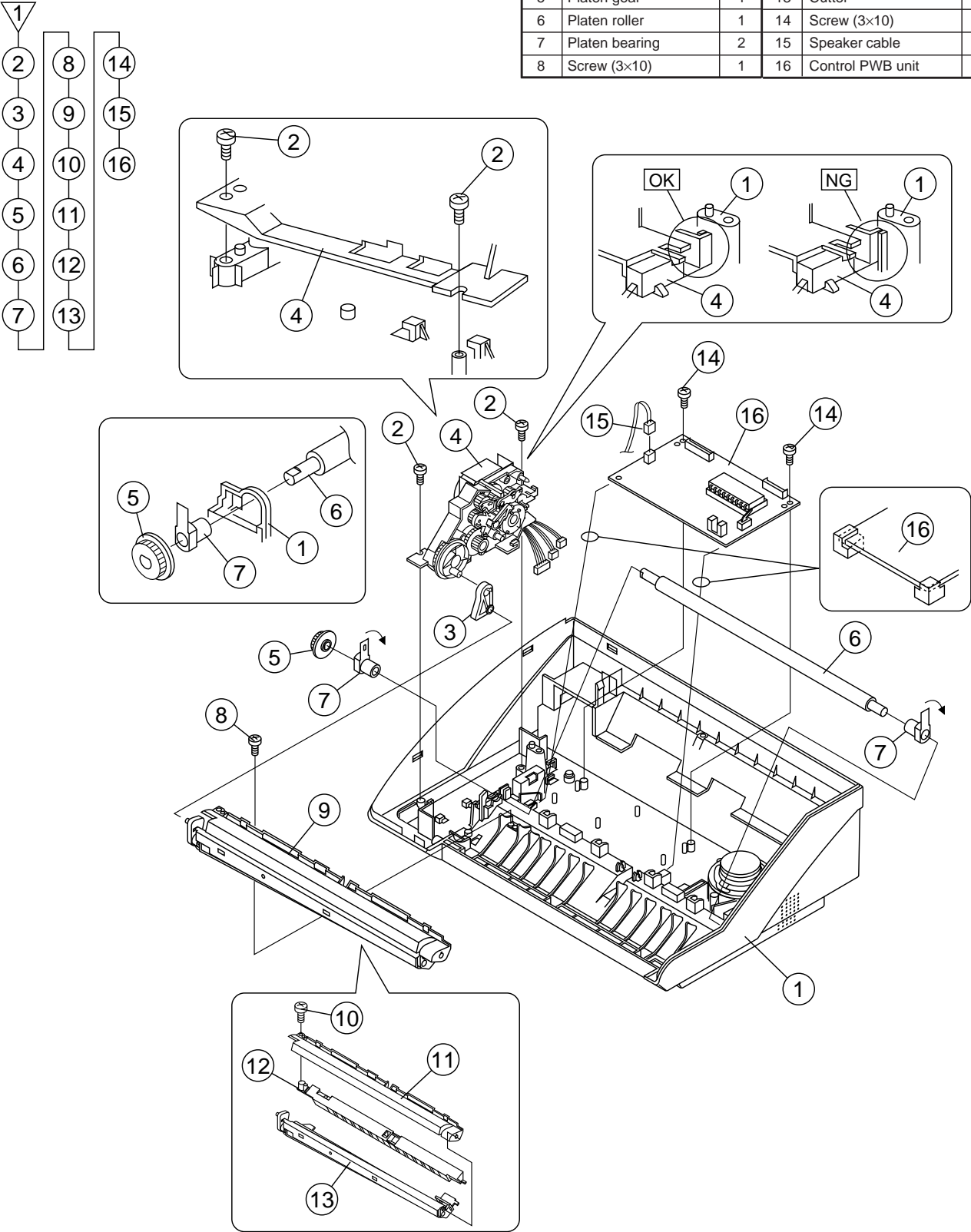


Fig. 7

8

Speaker and paper sensor lever

Parts list (Fig. 8)

No.	Part name	Q'ty
1	Mechanism unit	1
2	Paper sensor lever spring	1
3	Paper sensor lever	1
4	Screw	2
5	Speaker	1

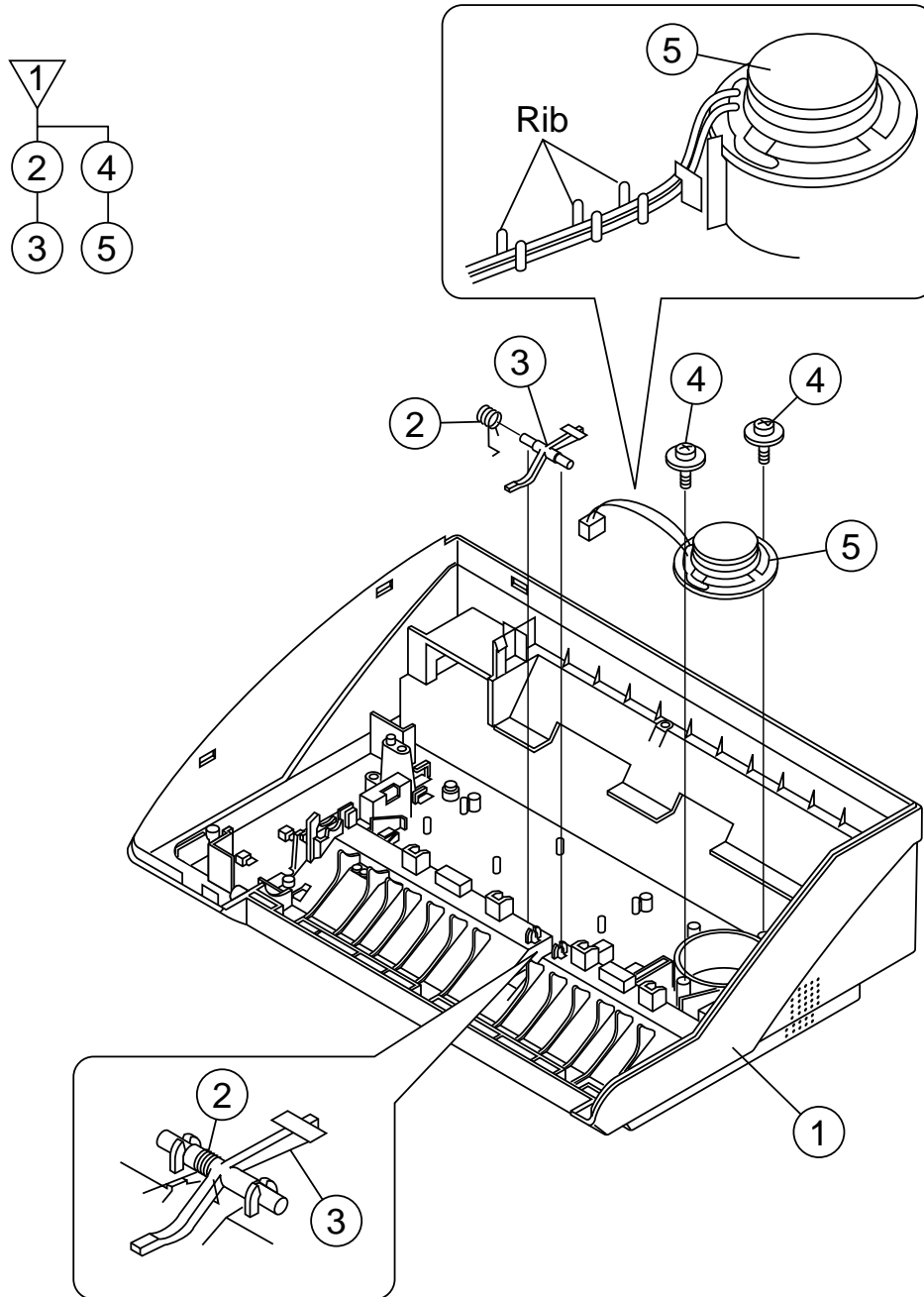


Fig. 8

No.	Part name	Q'ty	No.	Part name	Q'ty	No.	Part name	Q'ty
1	Cutter cam switch	1	11	Planet gear, 17Z	1	21	Reduction gear, 17/36Z	1
2	Planet gear, 17Z	1	12	Planet gear spring	1	22	Idler gear, 25Z	1
3	Planet gear spring	1	13	Planet gear lever A	1	23	Idler gear, 25Z	1
4	Planet gear lever C	1	14	Planet gear, 17Z	1	24	Idler gear, 20Z	1
5	Change lever spring	1	15	Planet gear spring	1	25	Screw (3×10)	1
6	Planet gear, 17Z	1	16	Planet gear lever B	1	26	Motor	1
7	Change lever A	1	17	Idler gear, 25Z	1	27	Motor heat sink	1
8	Cam	1	18	Cam switch	1	28	Drive frame	1
9	Reduction gear, 17/36Z	1	19	Reduction gear, 17/30Z	1			
10	Cutter gear, 44Z	1	20	Reduction gear, 17/30Z	1			



10

Wire treatment

Parts list (Fig. 10)

No.	Part name	Q'ty
1	Band (100m)	6
2	Screw (3×6)	2
3	Screw (4×6)	1
4	UL tape	3
5	Core (F2064)	1
6	Core (F2103)	1

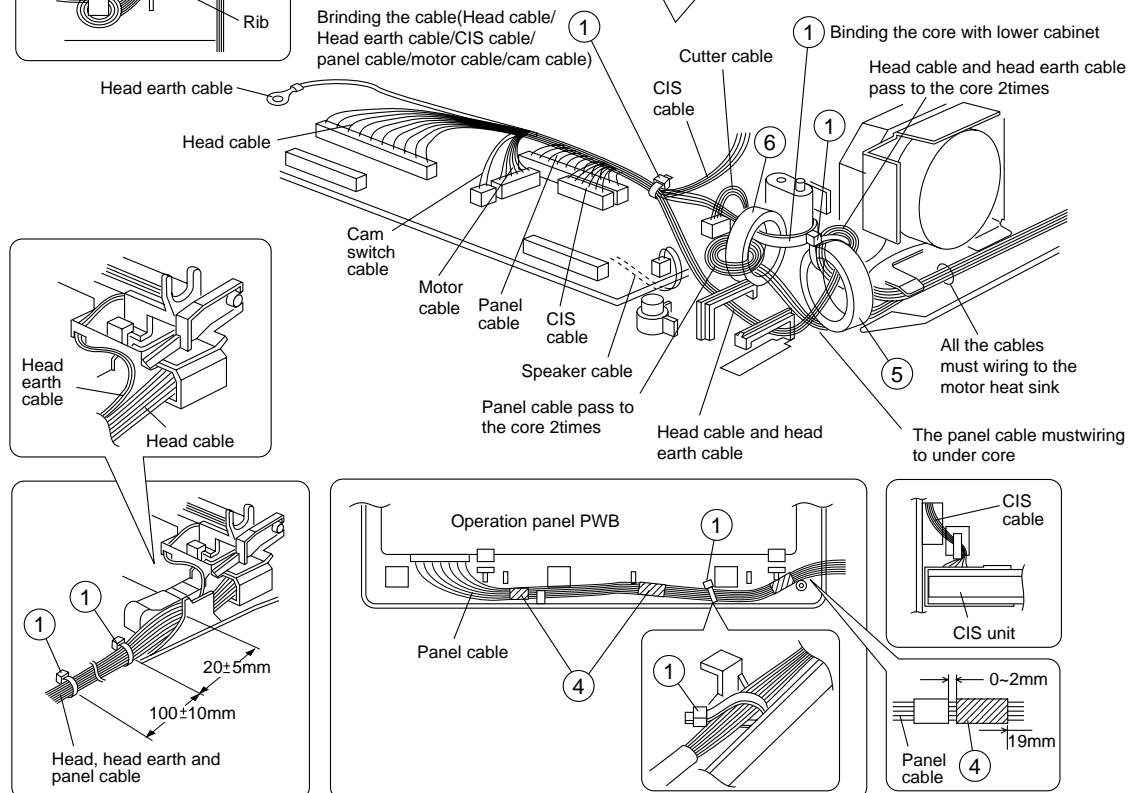
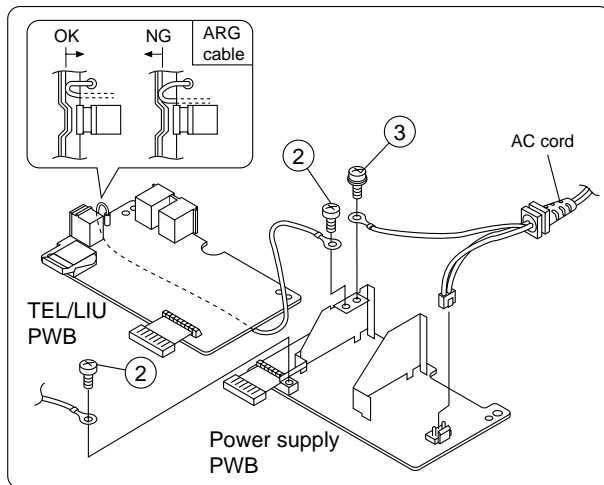
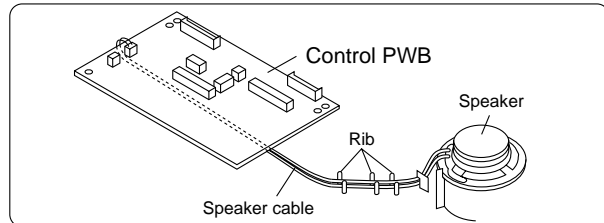
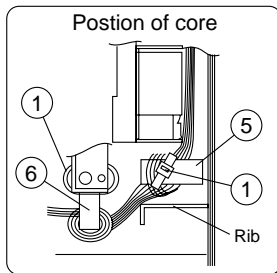
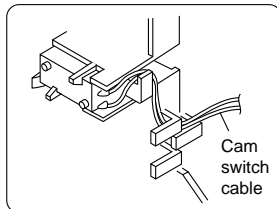
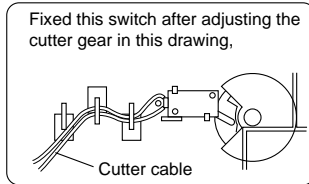
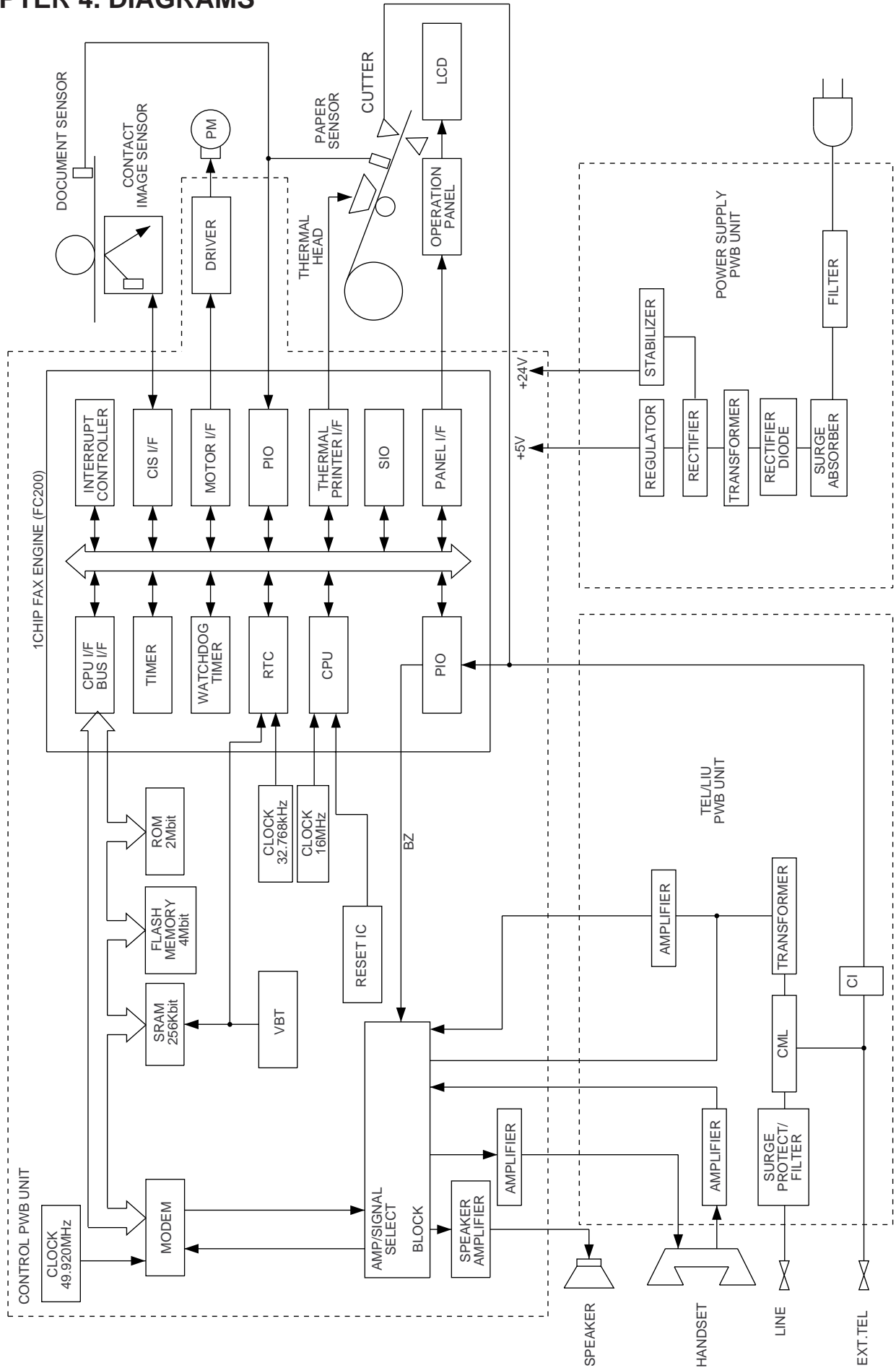


Fig. 10

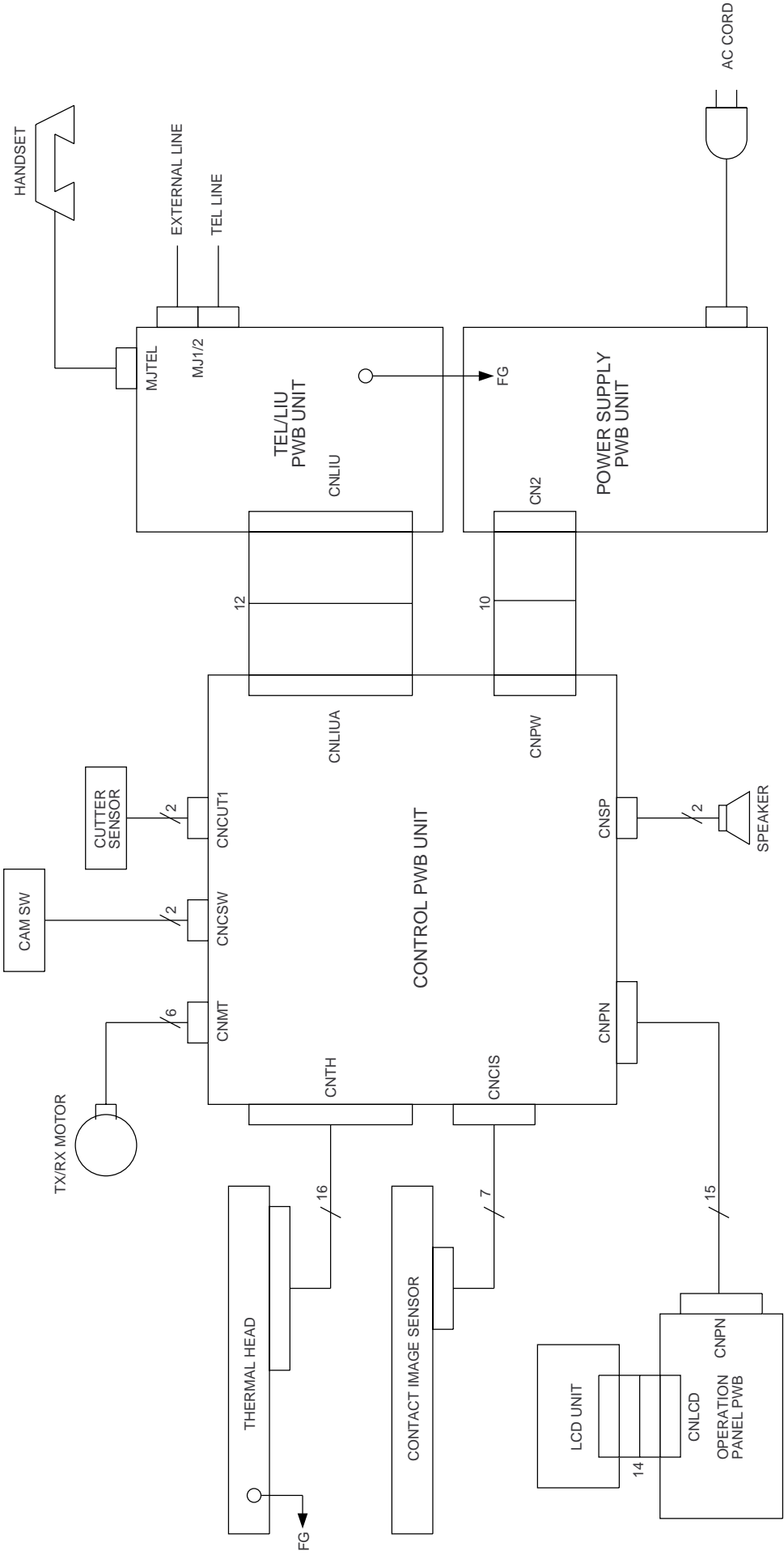


## CHAPTER 4. DIAGRAMS

[1] Block diagram



[2] Wiring diagram





## CHAPTER 5. CIRCUIT DESCRIPTION

### [1] Circuit description

#### 1. General description

The compact design of the control PWB is obtained by using ROCKWELL fax engine in the main control section and high density printing of surface mounting parts. Each PWB is independent according to its function as shown in Fig. 1.

#### 2. PWB configuration

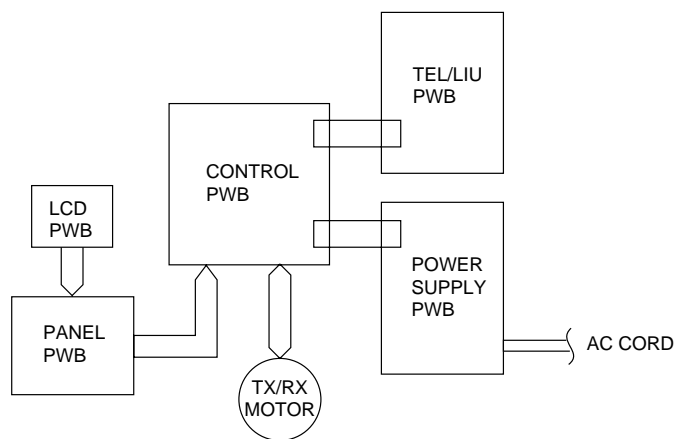


Fig. 1

##### 1) Control PWB

The control PWB controls peripheral PWBs, mechanical parts, transmission, and performs overall control of the unit. This machine employs a 1-chip modem (R96V24) which is installed on the control PWB.

##### 2) TEL/LIU PWB

This PWB controls connection of the telephone line to the unit.

##### 3) Power supply PWB

This PWB provides voltages of +5V and +24V to the other PWBs.

##### 4) Panel PWB

The panel PWB allows input of the operation keys.

##### 5) LCD PWB

This PWB controls the LCD display.

### 3. Operational description

Operational descriptions are given below:

- Transmission operation

When a document is loaded in standby mode, the state of the document sensor is sensed via the 1 chip fax engine (FC200). If the sensor signal was on, the motor is started to bring the document into the standby position. With depression of the START key in the off-hook state, transmission takes place.

Then, the procedure is sent out from the modem and the motor is rotated to move the document down to the scan line. In the scan processor, the signal scanned by the CIS is sent to the internal image processor and the AD converter to convert the analog signal into binary data. This binary data is transferred from the scan processor to the image buffer within the RAM and encoded and stored in the transmit buffer of the RAM. The data is then converted from parallel to serial form by the modem where the serial data is modulated and sent onto the line.

- Receive operation

There are two ways of starting reception, manual and automatic. Depression of the START key in the off-hook mode in the case of manual receive mode, or CI signal detection by the LIU in the automatic receive mode.

First, the FC200 controls the procedure signals from the modem to be ready to receive data. When the program goes into phase C, the serial data from the modem is converted to parallel form in the modem interface of the 1 chip fax engine (FC200) which is stored in the receive buffer of the RAM. The data in the receive buffer is decoded software-wise to reproduce it as binary image data in the image buffer. The data is DMA transferred to the recording processor within the FC200 which is then converted from parallel to serial form to be sent to the thermal head. The data is printed line by line by the FC200 which is assigned to control the motor rotation and strobe signal.

- Copy operation

To make a copy on this facsimile, the COPY key is pressed when the machine is in stand-by with a document on the document table and the telephone set is in the on-hook state.

First, depression of the COPY key advances the document to the scan line. Similar to the transmitting operation, the image signal from the CIS is converted to a binary signal in the DMA mode via the 1 chip fax engine (FC200) which is then sent to the image buffer of the RAM. Next, the data is transferred to the recording processor in the DMA mode to send the image data to the thermal head which is printed line by line. The copying takes place as the operation is repeated.

## [2] Circuit description of control PWB

### 1. General description

Fig. 2 shows the functional blocks of the control PWB, which is composed of 4 blocks.

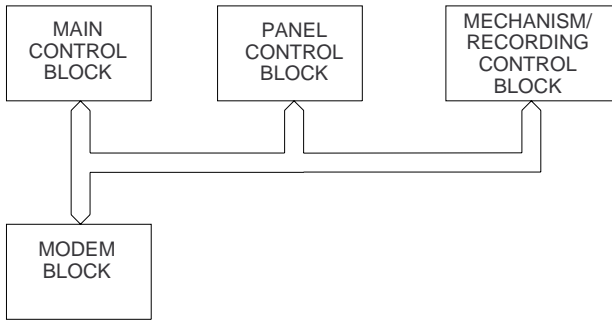


Fig. 2 Control PWB functional block diagram

### 2. Description of each block

#### (1) Main control block

The main control block is composed of ROCKWELL 1 chip fax engine (FC200), ROM (256KByte), RAM (32KByte) and FLASH MEMORY (512KByte).

Devices are connected to the bus to control the whole unit.

##### 1) FC200 (IC2) : pin-144 QFP (FC200)

The FAXENGINE Integrated Facsimile Controllers.

FC200, contains an internal 8 bit microprocessor with an external 16 Mbyte address space and dedicated circuitry optimized for facsimile image processing and facsimile machine control and monitoring.

#### 2) 27C020 (IC8): pin-32 DIP (ROM)

EPROM of 2Mbit equipped with software for the main CPU.

#### 3) W24257S-70LL (IC7): pin-28 SOP (SRAM)

Line memory for the main CPU system RAM area and coding/decoding process. Used as the transmission buffer.

Memory of recorded data such as daily report and auto dials. When the power is turned off, this memory is backed up by the lithium battery.

#### 4) KM29N040T (IC9): pin-44 TSOP (FLASH MEMORY)

A 512x8bit NAND FLASH MEMORY to store the voice and image data when using memory functions.

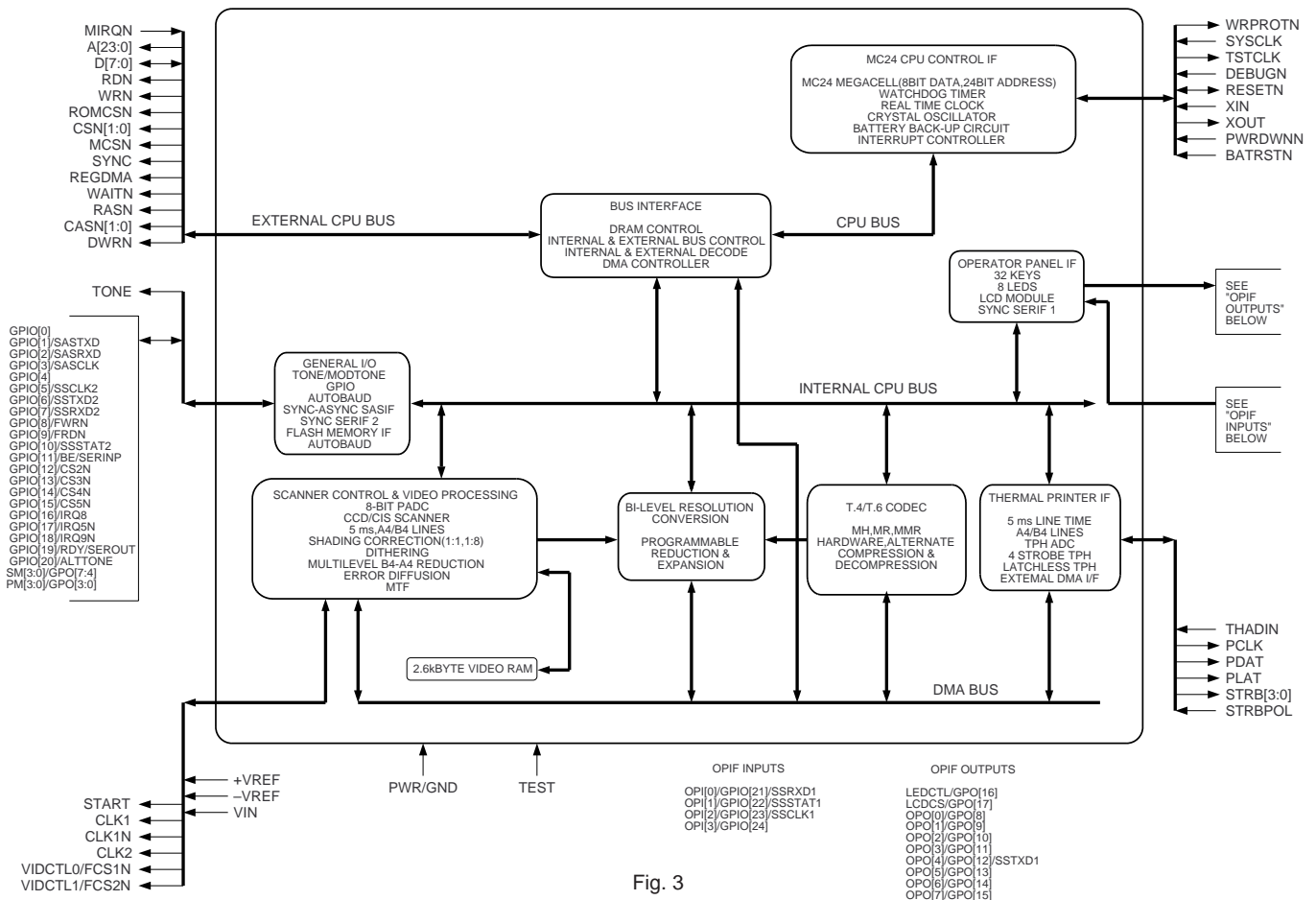


Fig. 3

**FC200 (IC2) Terminal descriptions**

Pin Name	Pin No.	I/O	Input Type	Output Type	Pin Description (Note: Active low signals have an "n" pin name ending.)
<b>CPU Control Interface</b>					
MIRQn	135	I	HU	–	Modem interrupt, active low. (Hysteresis In, Internal Pullup.)
SYSCLK	133	I	H	–	System clock. (Hysteresis In.)
TSTCLK	130	O	–	123XT	Test clock.
<b>Bus Control Interface</b>					
A[23:0]	[1:6][8:13] [15:20][22:27]	O	TU	123XT	Address bus (24-bit).
D[7:0]	[136:139] [141:144]	I/O	TU	123XT	Data bus (8-bit).
RDn	128	O	–	123XT	Read strobe.
WRn	127	O	–	123XT	Write strobe.
ROMCSn	120	O	–	123XT	ROM chip select.
CS1n	122	O	–	123XT	I/O chip select.
CS0n	57	O	–	123XT	SRAM chip select. (Battery powered.)
MCSn	121	O	–	123XT	Modem chip select.
SYNC	126	O	–	123XT	Indicates CPU op code fetch cycle (active high).
REGDMA	124	O	–	123XT	Indicates REGSEL cycle and DMA cycle.
WAITn	125	O	–	123XT	Indicates current TSTCLK cycle is a wait state or a halt state.
RASn	113	O	–	123XT	DRAM row address select. (Battery powered.)
CAS[1:0]n	[111:112]	O	–	123XT	DRAM column address select. (Battery powered.)
DWRn	109	O	–	123XT	DRAM write. (Battery powered.)
<b>Prime Power Reset Logic and Test</b>					
DEBUGn	129	I	HU	–	External non-maskable input (NMI).
RESETn	131	I/O	HU	2XO	XFC3 Reset.
TEST	58	I	C	–	Sets Test mode (Battery powered).
<b>Battery Power Control and Reset Logic</b>					
XIN	59	I	OSC	–	Crystal oscillator input pin.
XOUT	60	O	–	OSC	Crystal oscillator output pin.
PWRDWNn	62	I	H	–	Used by external system to indicate loss of power to XFC3. (Results in NMI)
BATRSTn	61	I	H	–	Battery power reset input.
WRPROTn	110	O	–	1XC	(Battery powered.) Write protect during loss of VDD power.
<b>Scanner Interface</b>					
START	101	O	–	2XS	Scanner shift gate control.
CLK1	100	O	–	2XS	Scanner clock.
CLK1n	99	O	–	2XS	Scanner clock-inverted.
CLK2	98	O	–	2XS	Scanner reset gate control (or clock for CIS scanner).
FCS1n/VIDCTL0	96	O	–	2XT	Flash memory chip select or Video Control signal.
FCS2n/VIDCTL1	97	O	–	2XT	Flash memory chip select or Video Control signal.
<b>Printer Interface</b>					
PCLK	29	O	–	3XC	Thermal Print Head (TPH) clock, or external DMAACK.
PDAT	30	O	–	2XP	Serial printing data (to TPH).
PLAT	31	O	–	3XP	TPH data latch.
STRB[3:0]	[33:36]	O	–	1XP	Strobe signals for the TPH.
STRBPOL	37	I	C	–	Sets strobe polarity, active high/low.
<b>Operator Panel Interface</b>					
OPO[0]/GPO[8]/ SMPWRCTRL	47	O	–	2XL	Keyboard/LED strobe [0] or GPO[8] or Scan Motor Power Control
OPO[1]/GPO[9]/ PMPWRCTRL	46	O	–	2XL	Keyboard/LED strobe [1] or GPO[9] or Print Motor Power Control
OPO[2]/GPO[10]/ RINGER	44	O	–	2XCT	Keyboard/LED strobe [2] or GPO[10] or RINGER
OPO[3]/GPO[11]	43	O	–	2XL	Keyboard/LED strobe [3] or GPO[11]
OPO[4]/GPO[12]/ SSTXD1	42	O	–	2XL	Keyboard/LED strobe [4] or GPO[12] or SSTXD1 (for SSIF1)
OPO[5]/GPO[13]	40	O	–	2XL	Keyboard/LED strobe [5] or GPO[13]
OPO[6]/GPO[14]	39	O	–	2XL	Keyboard/LED strobe [6] or GPO[14]
OPO[7]/GPO[15]	38	O	–	2XL	Keyboard/LED strobe [7] or GPO[15]
OPI[0]/GPIO[21]/ SSRXD1	52	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [0] or GPIO[21] or SSRXD1 (for SSIF1)
OPI[1]/GPIO[22]/ SSSTAT1	51	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [1] or GPIO[22] or SSSTAT1 (for SSIF1)
OPI[2]/GPIO[23]/ SSCLK1	50	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [2] or GPIO[23] or SSCLK1 (for SSIF1)

**FC200 (IC2) Terminal descriptions**

Pin Name	Pin No.	I/O	Input Type	Output Type	Pin Description
Operator Panel Interface					
OPI[3]/GPIO[24]	49	I/O	HU	2XC	(Pullup, Hysteresis In) Keyboard return [3] or GPIO[24]
LEDCTL	55	O	–	4XC	Indicates outputs OPO[7:0] are for LEDs.
LCDCS	54	O	–	1XC	LCD chip select.
General Purpose I/O					
GPIO[0]	94	I/O	H	2XC	(Hysteresis In) GPIO[0].
GPIO[1]/SASTXD	93	I/O	H	2XC	(Hysteresis In) GPIO[1] or SASTXD (for SERIF).
GPIO[2]/SASRXD	92	I/O	H	2XC	(Hysteresis In) GPIO[2] or SASRXD (for SERIF).
GPIO[3]/SASCLK	91	I/O	H	2XC	(Hysteresis In) GPIO[3] or SASCLK (for SERIF).
GPIO[4]/CPCIN	90	I/O	H	2XC	(Hysteresis In) GPIO[4] or Calling Party Control Input.
GPIO[5]/SSCLK2	89	I/O	H	2XC	(Hysteresis In) GPIO[5] or SSCLK2 (for SSIF2).
GPIO[6]/SSTXD2	87	I/O	H	2XC	(Hysteresis In) GPIO[6] or SSTXD2 (for SSIF2).
GPIO[7]/SSRXD2	86	I/O	H	2XC	(Hysteresis In) GPIO[7] or SSRXD2 (for SSIF2).
GPIO[8]/FWRn	85	I/O	H	2XC	(Hysteresis In) GPIO[8] or flash write enable signal for NAND-type flash memory.
GPIO[9]/FRDn	84	I/O	H	2XC	(Hysteresis In) GPIO[9] or flash read enable signal for NAND-type flash memory.
GPIO[10]/SSSTAT2	83	I/O	H	2XC	(Hysteresis In) GPIO[10] or SSSTAT2 (for SSIF2).
GPIO[11]/BE/SERINP	82	I/O	H	1XC	(Hysteresis In) GPIO[11] or bus enable or serial port data input for autobaud detection.
GPIO[12]/CS[2]n	80	I/O	H	2XC	(Hysteresis In) GPIO[12] or I/O chip select [2].
GPIO[13]/CS[3]n	79	I/O	H	2XC	(Hysteresis In) GPIO[13] or I/O chip select [3].
GPIO[14]/CS[4]n	78	I/O	H	2XC	(Hysteresis In) GPIO[14] or I/O chip select [4].
GPIO[15]/CS[5]n	77	I/O	H	2XC	(Hysteresis In) GPIO[15] or I/O chip select [5].
GPIO[16]/IRQ[8]	76	I/O	H	1XC	(Hysteresis In) GPIO[16] or external interrupt 8.
GPIO[17]/IRQ[5]n	75	I/O	H	1XC	(Hysteresis In) GPIO[17] or external interrupt 5.
GPIO[18]/IRQ[9]n	74	I/O	H	1XC	(Hysteresis In) GPIO[18] or external interrupt 9.
GPIO[19]/RDY/SEROUT	73	I/O	H	1XC	(Hysteresis In) GPIO[19] or ready signal or Serial port data output for autobaud detection.
GPIO[20]/ALTTONE	107	I/O	H	1XC	(Hysteresis In) GPIO[20] or ALTTONE.
Miscellaneous					
SM[3:0]/GPO[7:4]	[103:106]	O	–	1XC	Programmable: scan motor control pins or GPO pins.
PM[3:0]/GPO[3:0]	[115:118]	O	–	1XC	Programmable: print motor control pins or GPO pins.
TONE	119	O	–	1XC	Tone output signal.
Power, Reference Voltages, Ground					
-Vref/CLREF	66	I	-VR	–	Negative Reference Voltage for Video A/D or Reference Voltage for the Clamp Circuit.
ADXG	68	I	VXG	–	A/D Internal GND. (NOTE: This pin requires an external 0.22μF decoupling capacitor to ADGA.)
ADGA	69		VADG		A/D Analog Ground
ADVA	70		VADV		A/D Analog Power
ADGD	72		VADG		A/D Digital Ground
+Vref	71	I	+VR		Positive Reference Voltage for Video A/D.
VIN	67	I	VA	–	Analog Video A/D input.
THADI	65	I	TA	–	Analog Thermal A/D input.
Power and Ground					
VSS(12)	7,21,28,45,53,56,64,88,95,108,132,134				Digital Ground
VDD(8)	14,32,41,48,81,102,123,140				Digital Power
VBAT	63				Battery Power
VDRAM	114				DRAM Battery Power



(2) Panel control block

The following controls are performed by the FC200.

- Operation panel key scanning
- Operation panel LCD display

(3) Mechanism/recording control block

- Recording control block diagram (1)

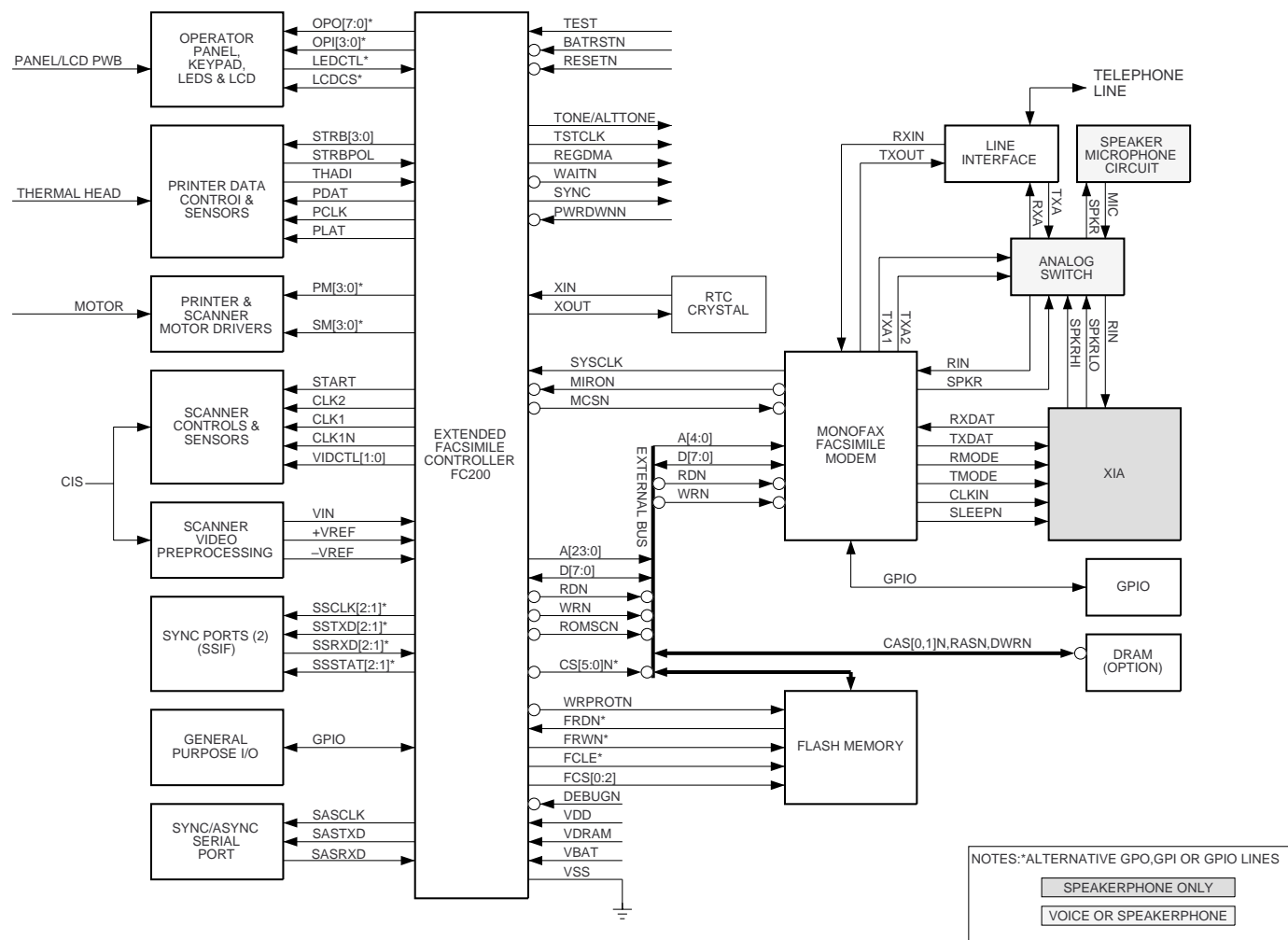


Fig. 4

## (4) Modem (R96V24) block

### INTRODUCTION

The Rockwell R96V24 MONOFAX® facsimile modem family provides 9600 bps half-duplex capability with options supporting DigiTalk™ voice and ADPCM audio codecs, DigiTalk™ full-duplex speakerphone, and V.23 full-duplex. The modem models are identified in Table.

These functions are supplied in a single VLSI device or two-device set (for speakerphone). The MDP (modem data pump) is packaged in a 100-pin PQFP. The MDP contains an internal integrated analog codec (IIA) and is pin-compatible with the R96V24 MONOFAX modems.

This device family enables cost-effective development of a common facsimile machine design with digital answering machine and/or full-duplex speakerphone.

The modem can operate at 9600, 7200, 4800, 2400, or 300 bps, and can perform HDLC framing per T.30 at all rates. A programmable DTMF detector, three programmable tone detectors, and Caller ID demodulator are provided.

The DigiTalk™ V24 voice coder/decoder (codec) compresses voice at an average rate of 2.9 kbps or at a fixed rate of 4.7 kbps with near toll quality playback. An average rate of 2.9 kbps provides 24 minutes of stored voice messages in 4 Mbits of memory. This voice codec allows the host controller to efficiently store and playback digital incoming messages (ICMs) and outgoing messages (OGMs).

The ADPCM audio codec compresses audio signals (e.g., music/voice) at 32 kbps or 24 kbps for highest fidelity coding and reproduction.

Selectable error correction coding allows storage in audio grade RAMs (ARAMs). Echo cancellation techniques employed during playback allow DTMF and tone detection during voice/audio codec operation to support user selectable features. The coder can record messages from either the IIA or XIA. Dual/single tone transmission is available when the decoder is disabled.

### FEATURES

- Group 3 facsimile transmission/reception
  - ITU-T V.29, V.27 ter, T.30, V.21 Channel 2, T.4
  - HDLC framing at all speeds
  - Receive dynamic range: 0 dBm to –43 dBm
  - Automatic adaptive equalization
  - Fixed and programmable digital compromise equalization
- V.27 ter short train
- V.21 channel 2
  - DTMF detect and tone detect
- Caller ID reception
  - Compromise equalizer
- DigiTalk™ voice codec
  - 24 minutes of voice storage per 4 Mbit memory
  - Near toll quality voice recording and playback
  - Programmable AGCs
  - Error correction coding allows ARAM usage
  - DTMF detect, tone detect, and tone transmit
  - Pitch synchronized fast and slow playback
  - Near-end echo cancellation
- ADPCM audio codec
  - High fidelity recording and playback of audio signals
  - 32 kbps and 24 kbps
  - Programmable AGC
  - DTMF detect, tone detect, and tone transmit
  - Near-end echo cancellation
- 8-bit or 16-bit high quality audio mode transmission/reception

## R96V24 (IC1) Hardware Interface Signals

### Pin Signals – 100-Pin PQFP

Pin No.	Signal Name	I/O Type
1	RS4	IA
2	RS3	IA
3	RS2	IA
4	RS1	IA
5	RS0	IA
6	VDD1	PWR
7	D7	IA/OB
8	D6	IA/OB
9	D5	IA/OB
10	D4	IA/OB
11	D3	IA/OB
12	D2	IA/OB
13	D1	IA/OB
14	D0	IA/OB
15	WRITE	IA
16	DGND1	GND
17	RXOUT	MI
18	RMODE	MI
19	TSTROBE	MI
20	TRESET	MI
21	DGND A1	GND
22	NC	
23	TMODE	MI
24	TXDAT	MI
25	AVDD	PWR
26	TALK	OD
27	AGND1	GND
28	TXA1	O(DD)
29	TXA2	O(DD)
30	DGND A2	GND
31	NC	
32	NC	
33	NC	
34	NC	
35	VAA1	PWR
36	SLEEP	MI
37	AGND2	GND
38	RIN	I(DA)
39	VC	MI
40	VREF	MI
41	NC	
42	NC	
43	DGND A3	GND
44	SPKR	O(DF)
45	VAA2	PWR
46	OH	OD
47	POR	MI
48	CLKIN	MI
49	NC	
50	IACLK	MI
51	NC	
52	CS	IA
53	READ	IA
54	GPI2	IA
55	GPI3	IA
56	GPI4	IA
57	GPI5	IA
58	VDD2	PWR
59	GPI6	IA

Pin No.	Signal Name	I/O Type
60	GP17/RINGD	IA
61	GPO7	OB
62	GPO6	OB
63	GPO5	OB
64	GPO4	OB
65	GPO3	OB
66	DGND2	GND
67	CTS	OA
68	IRQ1	OC
69	GPO2	OB
70	GPO1	OB
71	GPO0	OB
72	RESET	OA
73	XTLI	I
74	XTLO	O
75	XCLK	OD
76	YCLK	OD
77	VDD3	PWR
78	IRQ2	OC
79	SR3IN	MI
80	DGND3	GND
81	DGND4	GND
82	SR4IN	MI
83	SR3OUT	MI
84	EYESYNC	OA
85	EYECLK	OA
86	IA1CLK	MI
87	SA1CLK	MI
88	SR1IO	MI
89	EYEXY	OA
90	SR4OUT	MI
91	NC	
92	RLSD	OA
93	DCLK	OA
94	EN85	IA
95	GPI0	IA
96	RTS	IA
97	DGND5	GND
98	GPI1	IA
99	TXD	IA
100	RXD	OA

**Notes:**  
I/O type:  
MI = Modem interconnect.  
IA, IB, IC, ID = digital input.  
OA, OB, OC, OD = digital output.  
I(DA) = analog input.  
O(DD), O(DF) = analog output.  
NC = No external connection allowed.

## [3] Circuit description of TEL/LIU PWB

### (1) TEL/LIU block operational description

#### 1) Block diagram

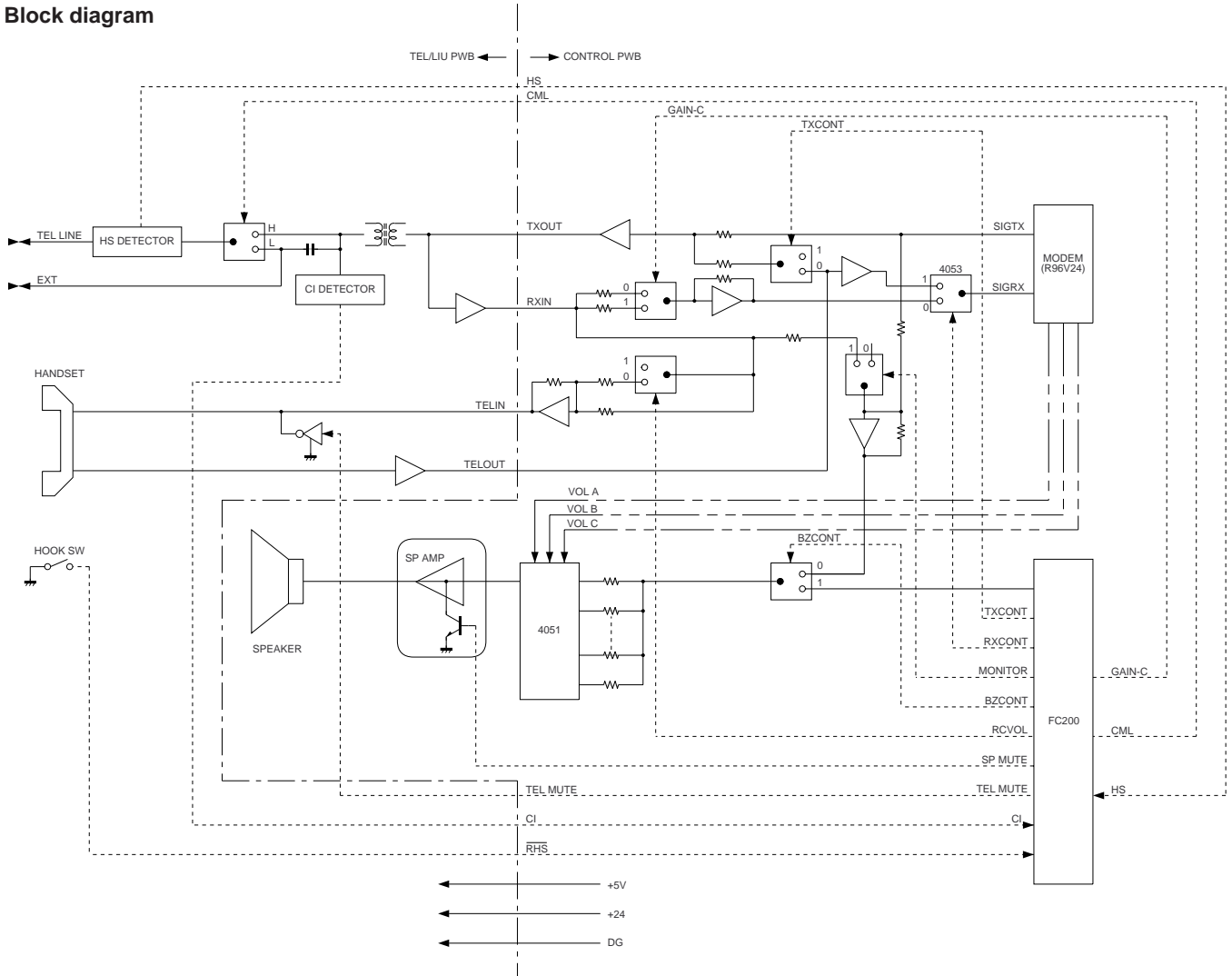


Fig. 5

### 2) Circuit description

The TEL/LIU PWB is composed of the following 7 blocks.

1. Speech circuit section
2. Dial transmission section
3. Speaker amplifier section
4. Ringer circuit section
5. Externally connected TEL OFF HOOK detection circuit
6. CI detection circuit
7. Signal/DTMF transmission level & receiving level

### 3) Block description

#### 1. Speech circuit section

- The receiver volume is an electronic volume type, this model is switch in 2 steps.

#### 2. Dial transmission section

- D.P. transmission: The CML relay is turned on and off for control in the DP calling system. (Refer to the attached sheet.)
- DTM transmission: It is formed in the modem, and is output.

#### 3. Speaker amplifier section

- The volume of the ringer sound/speaker sound is controlled with 3-bit signal of VOLA, VOLB and VOLC, and the sound switch is controlled with BZ CONT.

#### 4. Ringer circuit section

- The ringer sound is formed in the tone of 1-chip engine when CI signal is detected. The amplifier circuit drives the speaker of the main body.

## 5. Externally connected TEL OFF HOOK detection circuit section

- The circuit current detection is turned on together with OFF HOOK of main body or OFF HOOK of externally connected TEL. ON of CML OFF is judged as OFF HOOK of externally connected TEL.

## 6. CI detection circuit

- CI is detected by the photocoupler which is integrated in series in the primary side TEL circuit well proven in the existing unit.

## 7. Signal/DTMF transmission level & receiving level

- Signal transmission level setting: ATT 7 dB Circuit output: 7 dBm.
- DTMF transmission level setting: HF -6.0 dBm LF -7.0 dBm  
Thus, set the level.
- Attenuation in the LIU section of the receiving level is designed at -6 dBm. (The modem and circuit error are not included.)

## 7. Signal selection

The following signals are used to control the transmission line of TEL/FAX signal. For details, refer to the signal selector matrix table.

[Control signals from output port]

Signal Name	Description				
CML (The circuit is located in the TEL/LIU PWB.)	<u>Line connecting relay and DP generating relay</u> H: Line make L: Line break				
SP MUTE (The circuit is located in the TEL/LIU PWB.)	<u>Speaker tone mute control signal</u> H: Muting (Power down mode) L: Muting cancel (Normal operation)				
TEL MUTE	<u>Handset reception mute control signal</u> H: Muting L: Muting cancel				
VOL A VOL B VOL C (The circuit is located in the control PWB.)	<u>Speaker volume control signal.</u>				
	VOL A VOL B VOL C matrix				
	OUTPUT	VOL A	VOL B	VOL C	OH-HOOK Receiving
	X0	L	L	L	—
	X1	H	L	L	—
	X2	L	H	L	HIGH
	X3	H	H	L	MIDDLE1
	X4	L	L	H	MIDDLE2
	X5	H	L	H	MIDDLE3
	X6	L	H	H	LOW
	X7	H	H	H	—
	OUTPUT	RINGER	BUZZER	DTMF	ICM/OGM
	X0	—	—	—	HIGH
	X1	HIGH	—	—	MIDDLE1
	X2	—	—	—	MIDDLE2
X3	MIDDLE	—	HIGH	MIDDLE3	
X4	—	FIXED	MIDDLE1	—	
X5	—	—	MIDDLE2	LOW	
X6	—	—	MIDDLE3	—	
X7	LOW	—	LOW	—	
• The volume settings of ON-HOOK receiving DTMF and ICM/OGM must be performed together. (The setting of RINGER must be performed separately.)					
TXCONT (The circuit is located in the control PWB.)	<u>TXOUT mute signal</u> L: Signal sending, when transmitting H: During reception, transmission mute, (during standby)				
GAIN-C (The circuit is located in the control PWB.)	<u>Reception gain switching signal</u> H: When connected to line, 1: 1 gain L: When not connected to line, HIGH gain				
BZCONT (The circuit is located in the control PWB.)	<u>Speaker output signal switching</u> H: Buzzer signal output L: When monitoring line signal				

[Signals for status recognition according to input signals]

Signal Name	Function
$\overline{\text{RHS}}$	H: The handset is in the on-hook state. L: The handset is in the off-hook state.
CI	Incoming call (CI) detection signal
$\overline{\text{HS}}$	H: The handset or external telephone is in the on-hook state. L: The handset or external telephone is in the off-hook state.

[Other signals]

Signal Name	Function
TEL IN	Receiving signal from line or modem
TEL OUT	Transfer signal to line
SPOUT	Speaker output signal
TXOUT	Transmission (DTMF) analog signal output from modem
RXIN	Reception (DTMF, others) analog signal input into modem

NO	Signal Name (CNLIU)	NO	Signal Name (CNLIU)
1	TELOUT	7	RXIN
2	TELIN	8	TXOUT
3	TELMUTE	9	CML
4	CI	10	+24VA
5	HS	11	+5V
6	RHS	12	DG

(Example: TEL speaking)

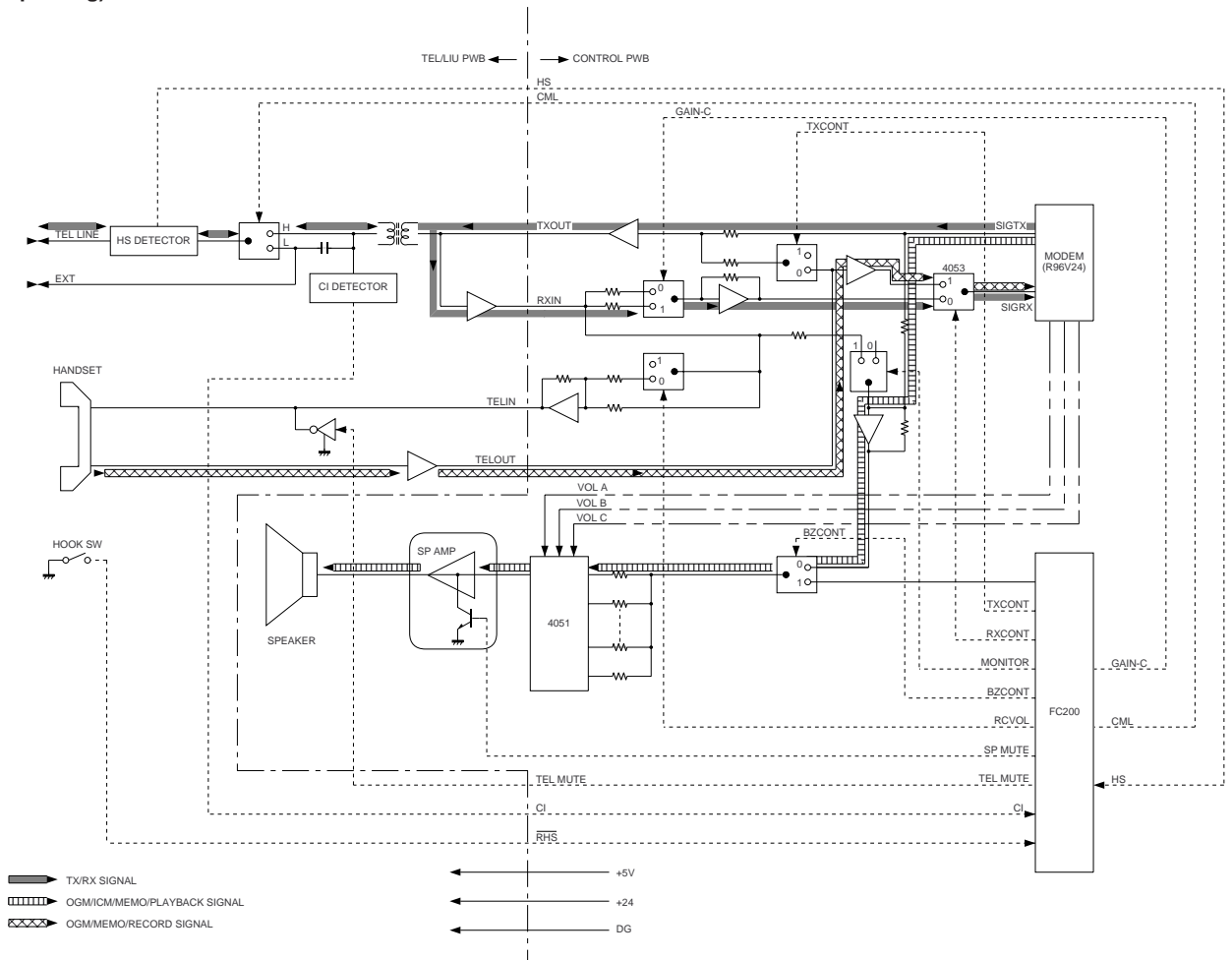


Fig. 6

[4] Circuit description of power supply PWB

1. Block diagram

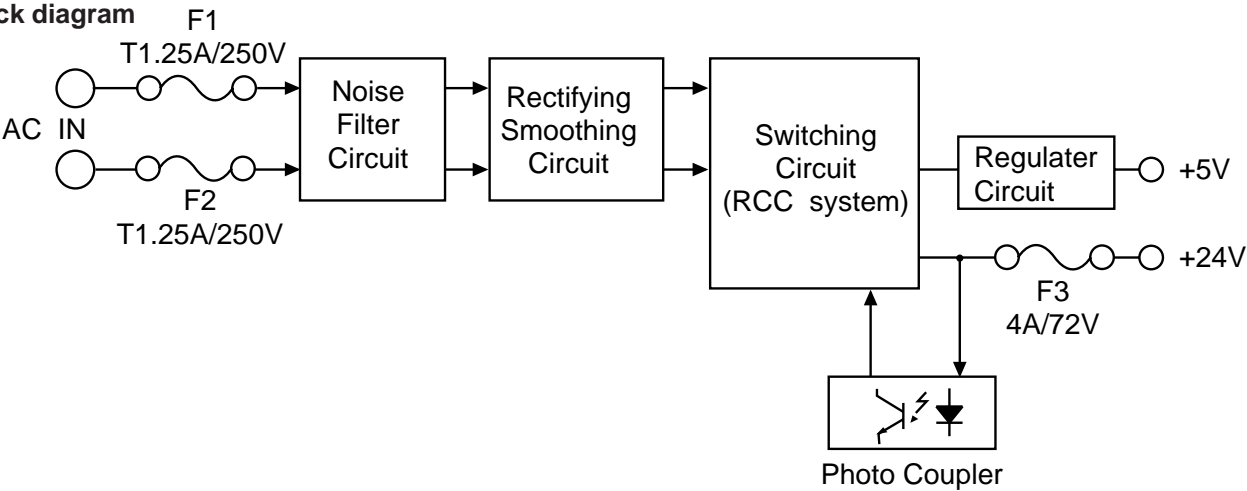


Fig. 7

2-1. Noise filter circuit

The input noise filter section is composed of L and C, which reduces normal mode noise from the AC line and common mode noise to the AC line.

2-2. Rectifying/smoothing circuit

The AC input voltage is rectified by diode D1, 2, 3, 4 and smoothed by capacitor C5 to supply DC voltage to the switching circuit section.

Power thermistor TH1 suppresses inrush current at power switch-on.

2-3. Switching circuit

This circuit employs the self excited ringing choke convertor (RCC) system. In this system, the DC voltage supplied from the rectifying/smoothing section is converted into high frequency pulses by ON/OFF repetition of MOS FET Q1.

Energy is charged in the primary winding of T1 during ON period of Q1, and discharged to the secondary winding during OFF period.

The output voltage is controlled by adjusting ON period of Q1 which changes charge time of C9 through operation of photo-coupler PC1 from +24V output.

The overcurrent protection is performed by bringing Q1 to OFF state through detection of voltage increase in the auxiliary winding of T1 by ZD2 and R9.

The overvoltage protection is performed by operating the overcurrent protection circuit through destruction of zener diode ZD4 and short-circuiting of load.

2-4. +5V circuit

Each DC voltage supplied by rectifying the output of transformer T1 with diode D8 is stabilized by 3-terminal regulator IC1.

2-5. VTH circuit

VTH output is supplied through the relay RY1. Relay RY1 is operated by VTH-ON signal.

[5] Circuit description of CIS unit

1. CIS

Cis is an image sensor which puts the original paper in close contact with the full-size sensor for scanning, being a monochromatic type with the pixel number of 1,728 dots and the main scanning density of 8 dots/mm.

It is composed of sensor, rod lens, LED light source, light-conductive plate, control circuit and so on, and the reading line and focus are previously adjusted as the unit.

Due to the full-size sensor, the focus distance is so short that the set is changed from the light weight type to the compact type.

2. Waveforms

The following clock is supplied from FC200 of the control board, and VO is output.

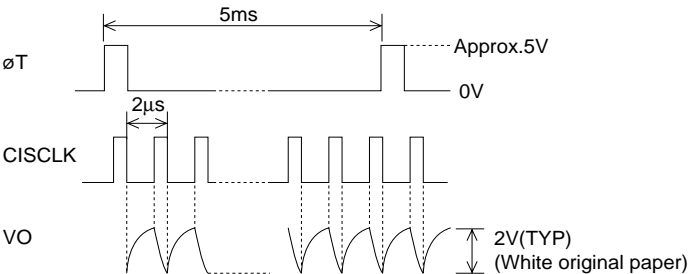
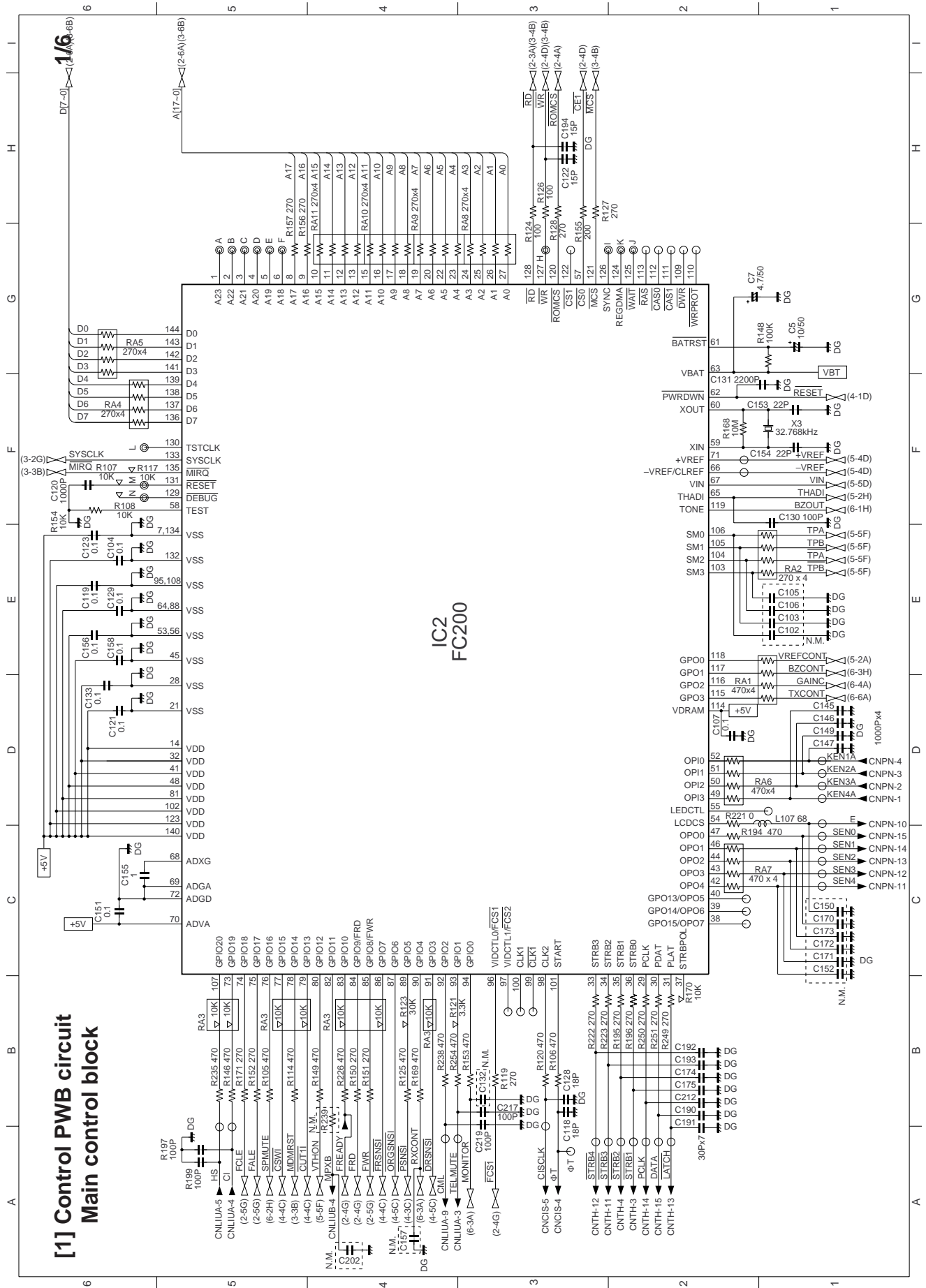
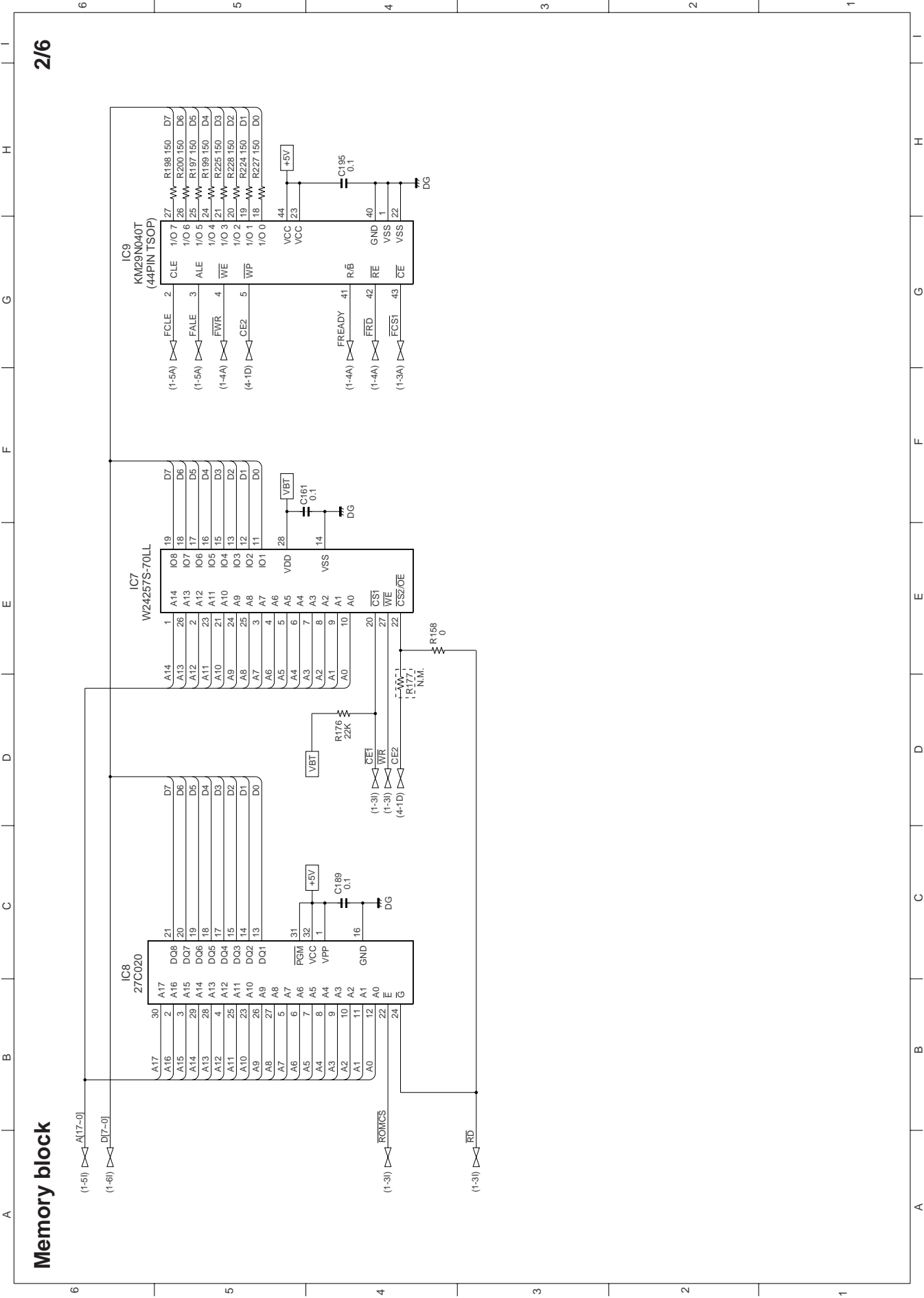


Fig. 8



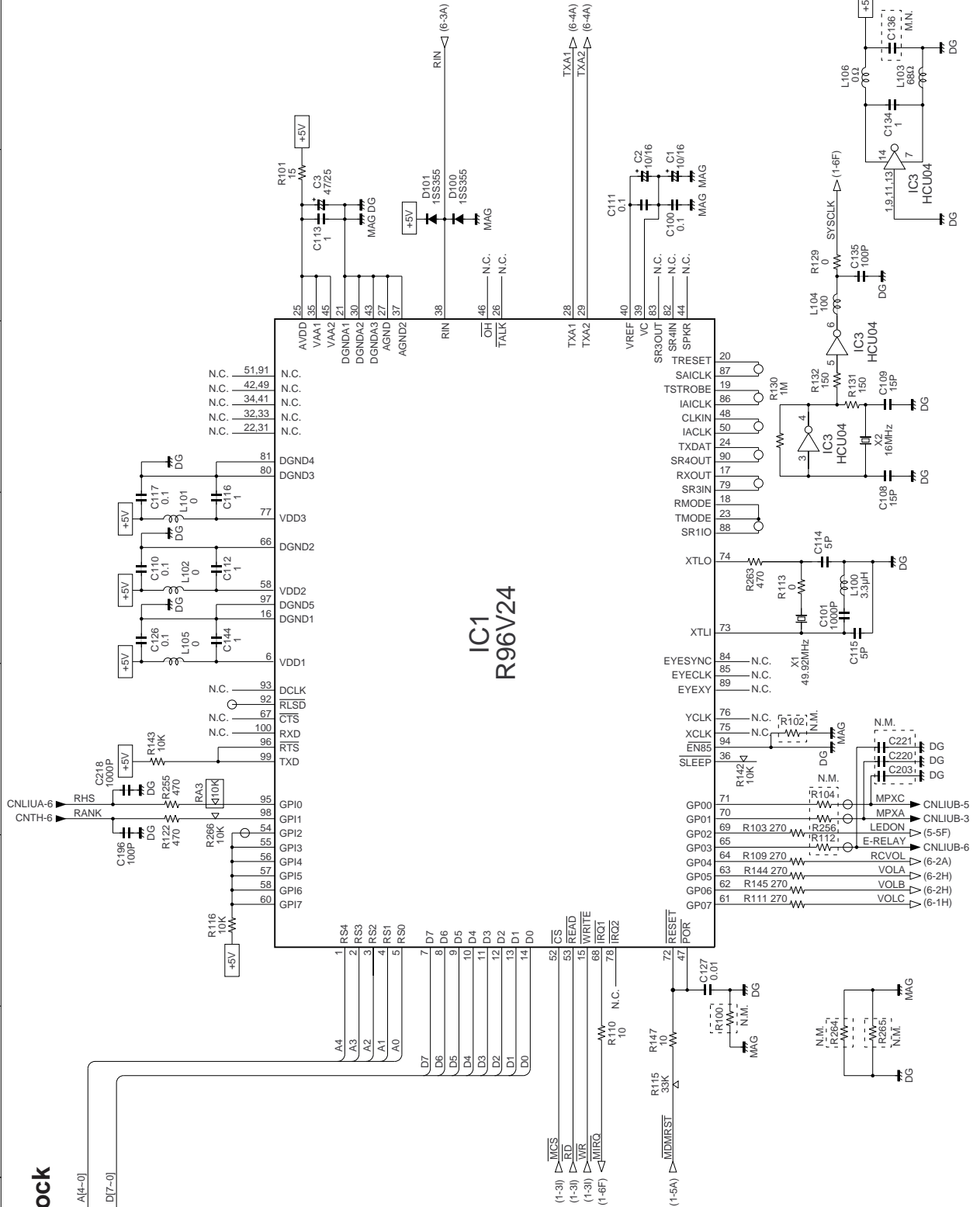
## CHAPTER 6. CIRCUIT SCHEMATICS AND PARTS LAYOUT

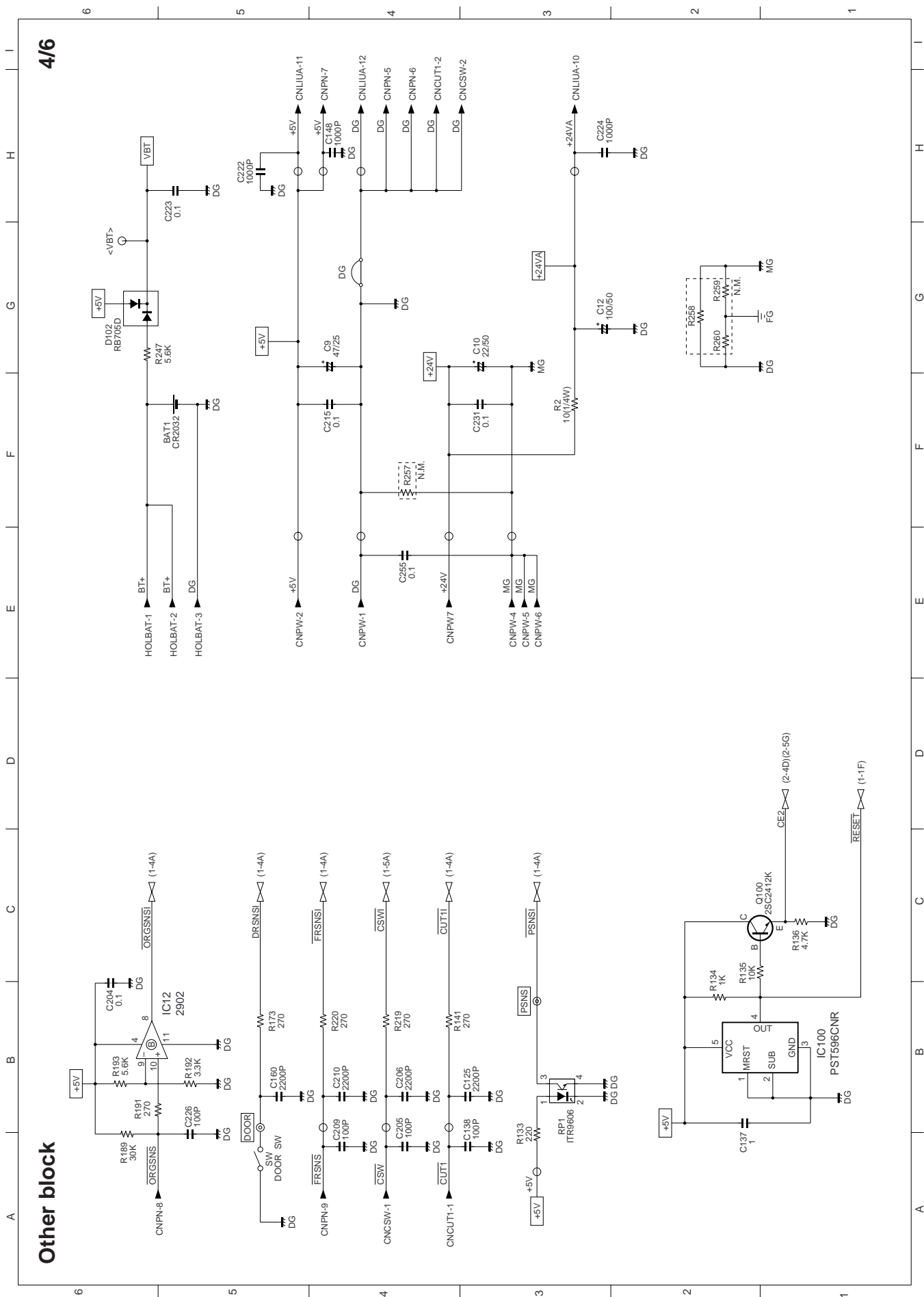




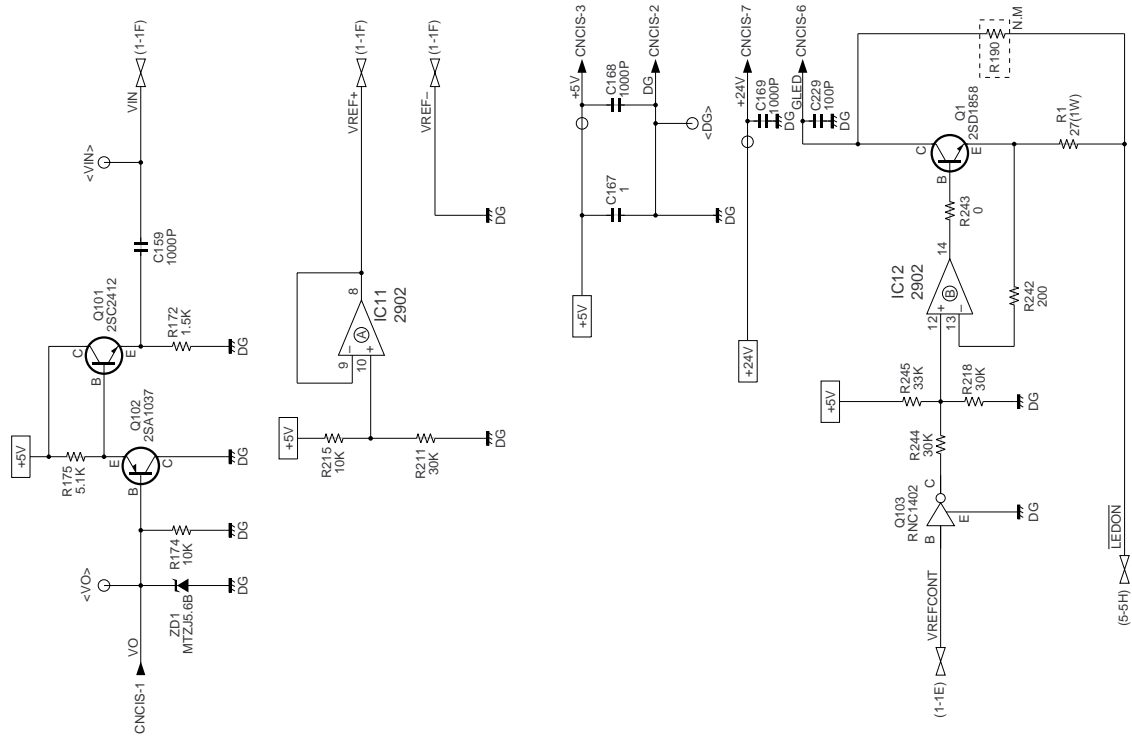
# Modem block

3/6

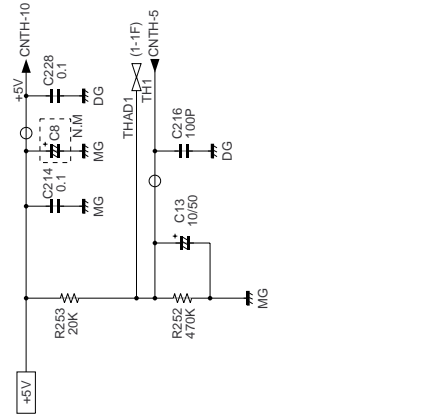
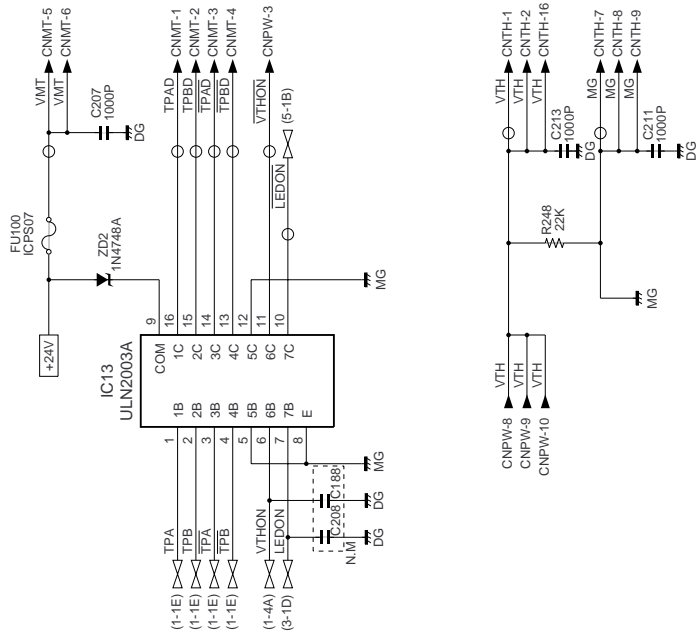


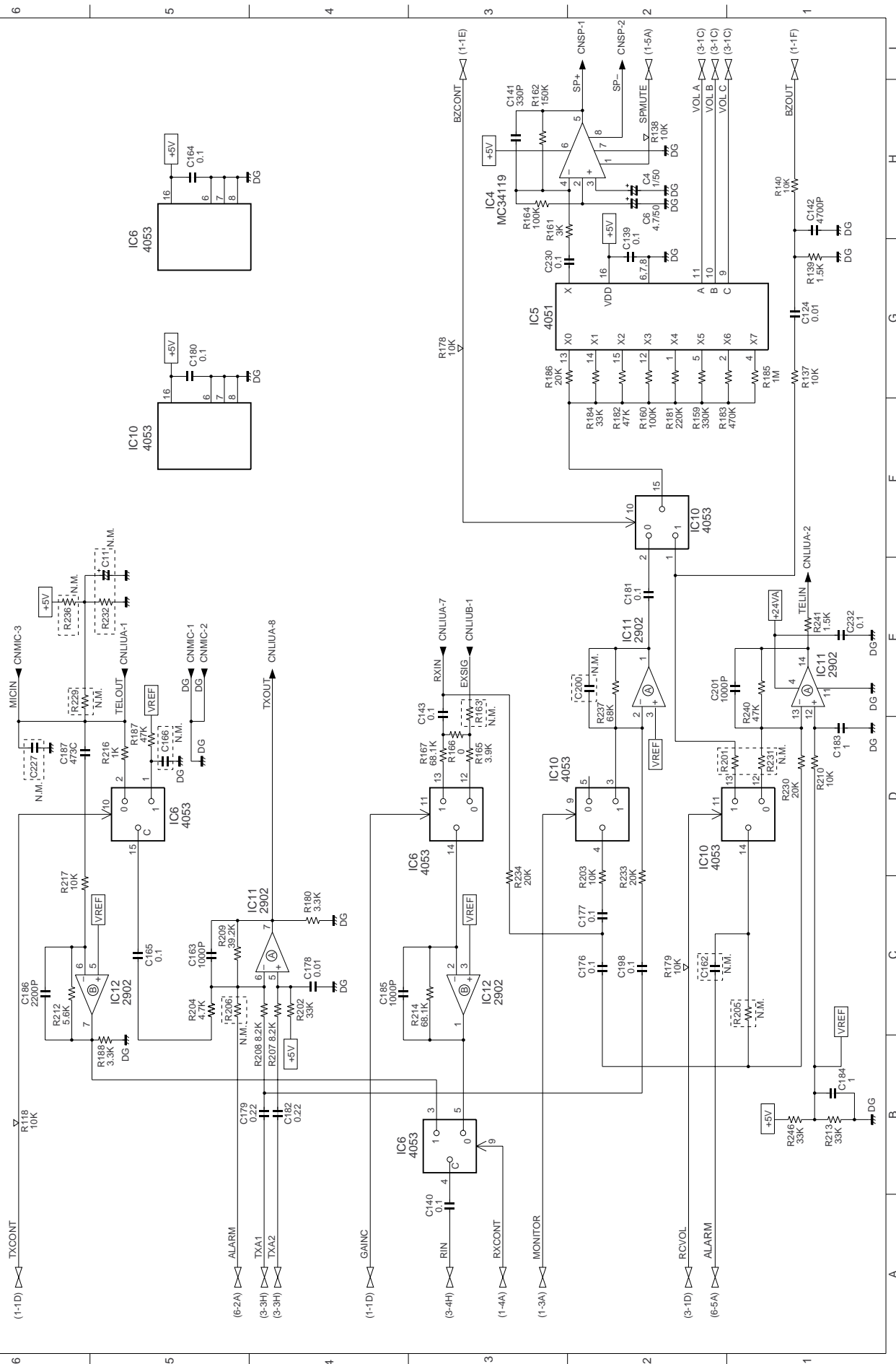


## Video processing/Motor drive / Thermal block

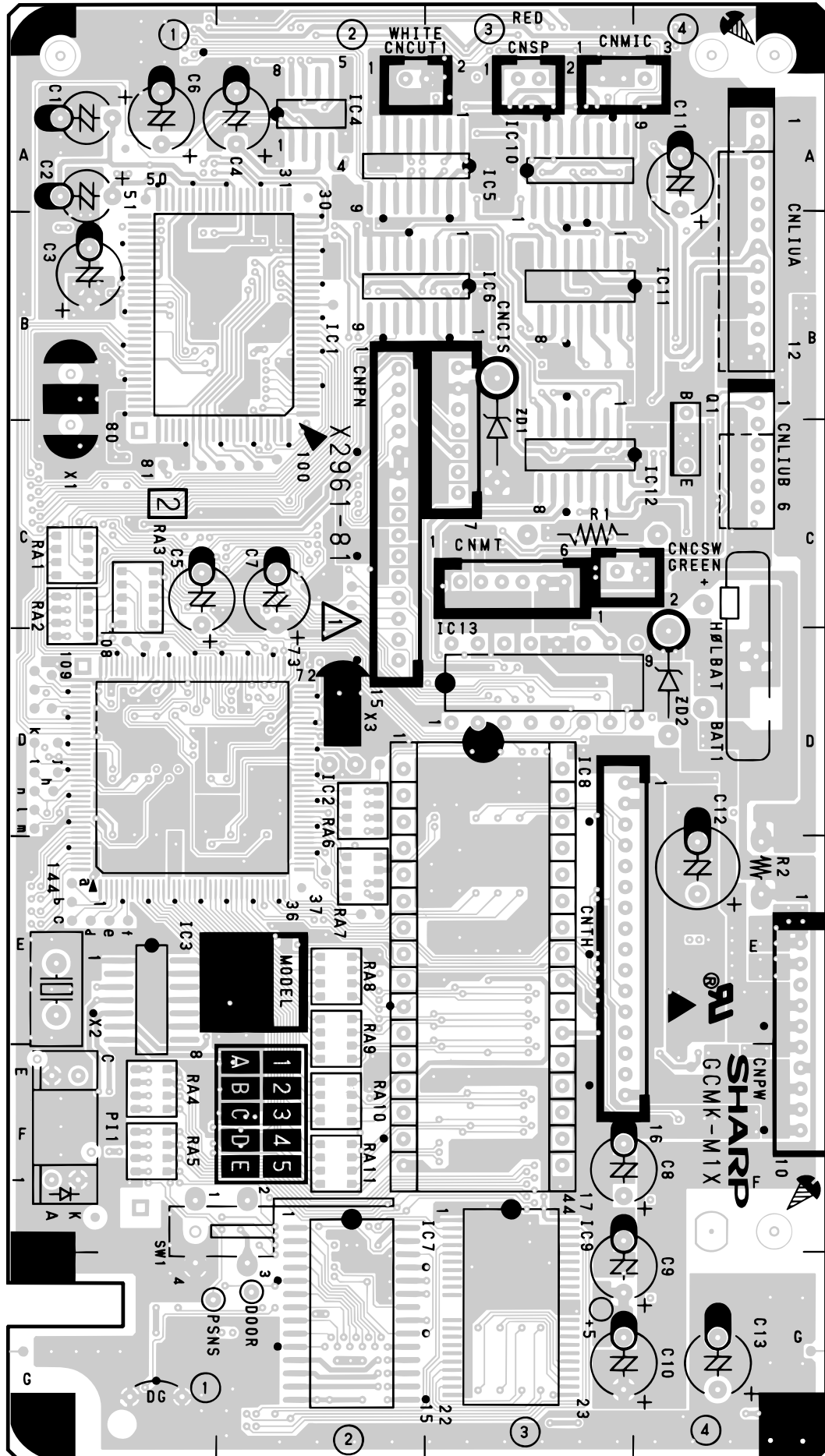


## 5/6



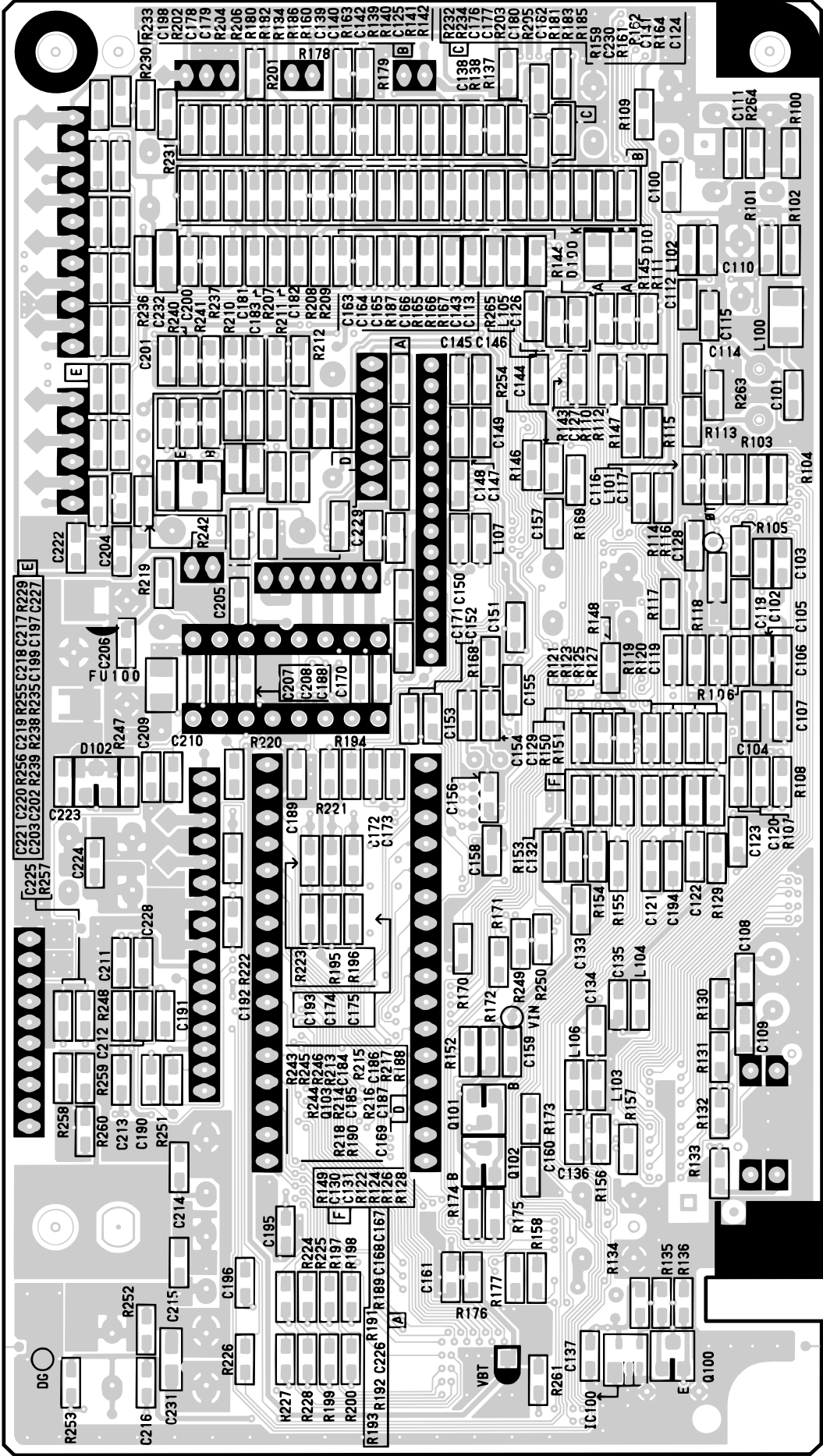


# Control PWB parts layout (Top side)

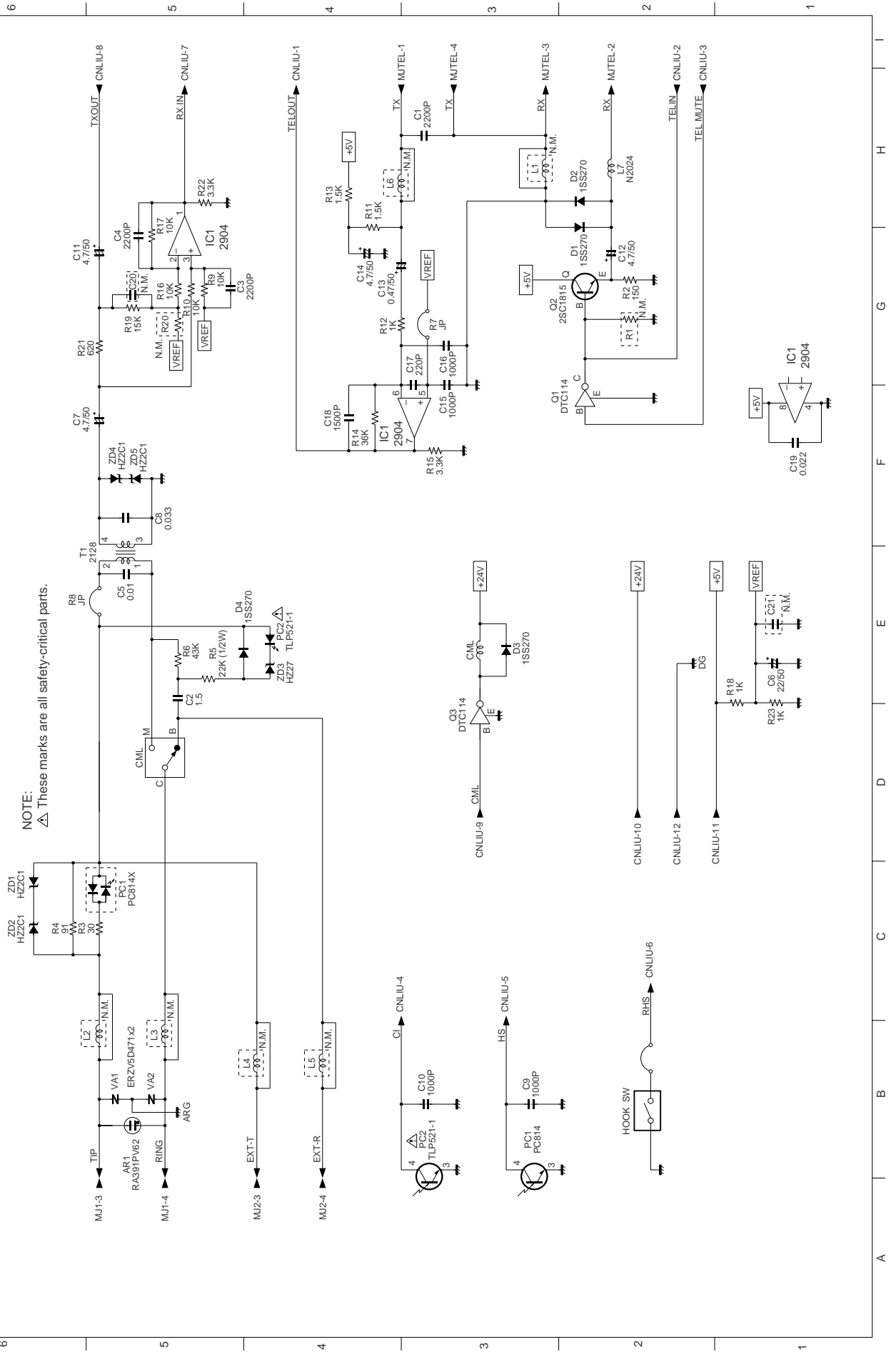




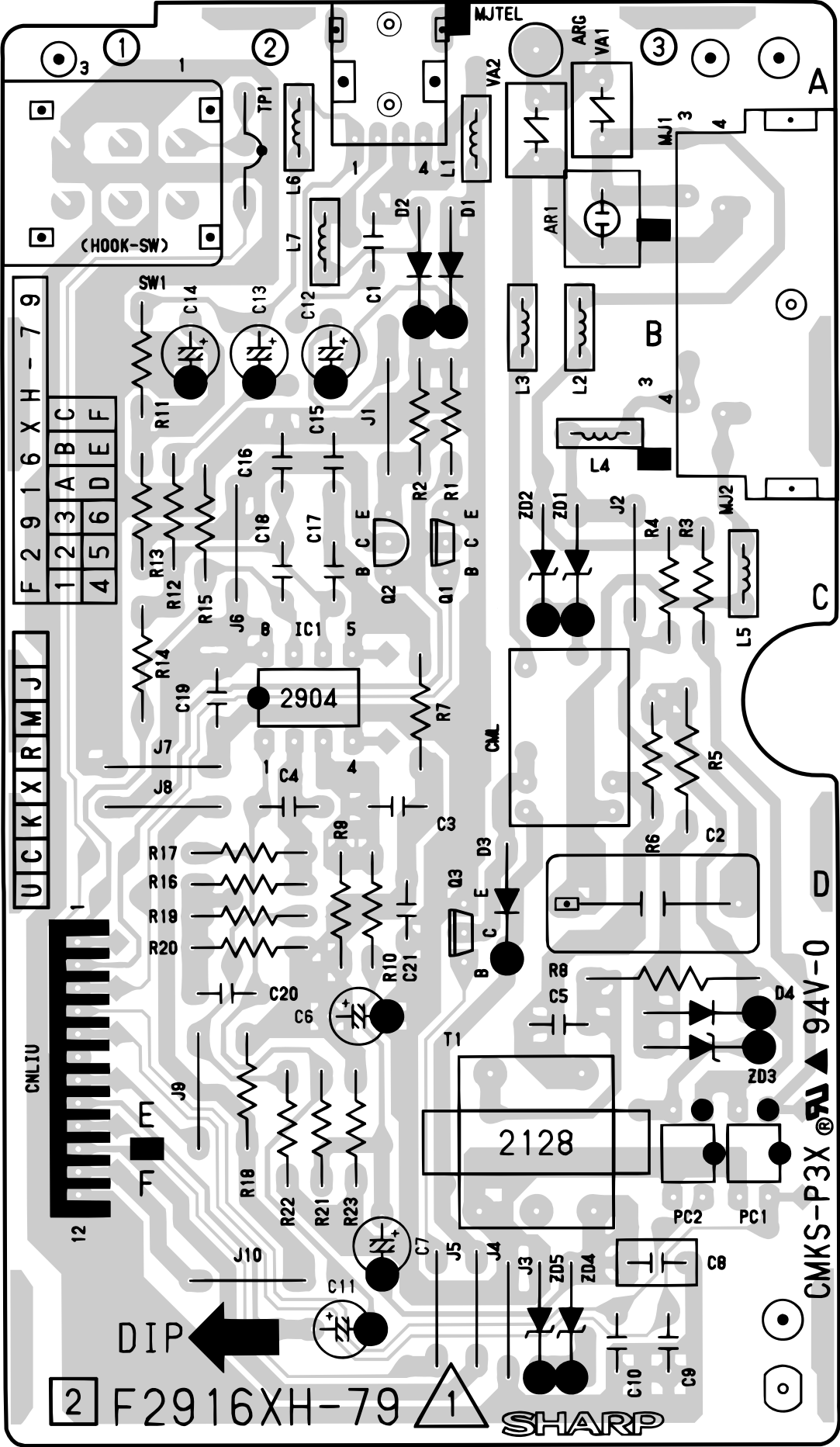
Control PWB parts layout (Bottom side)



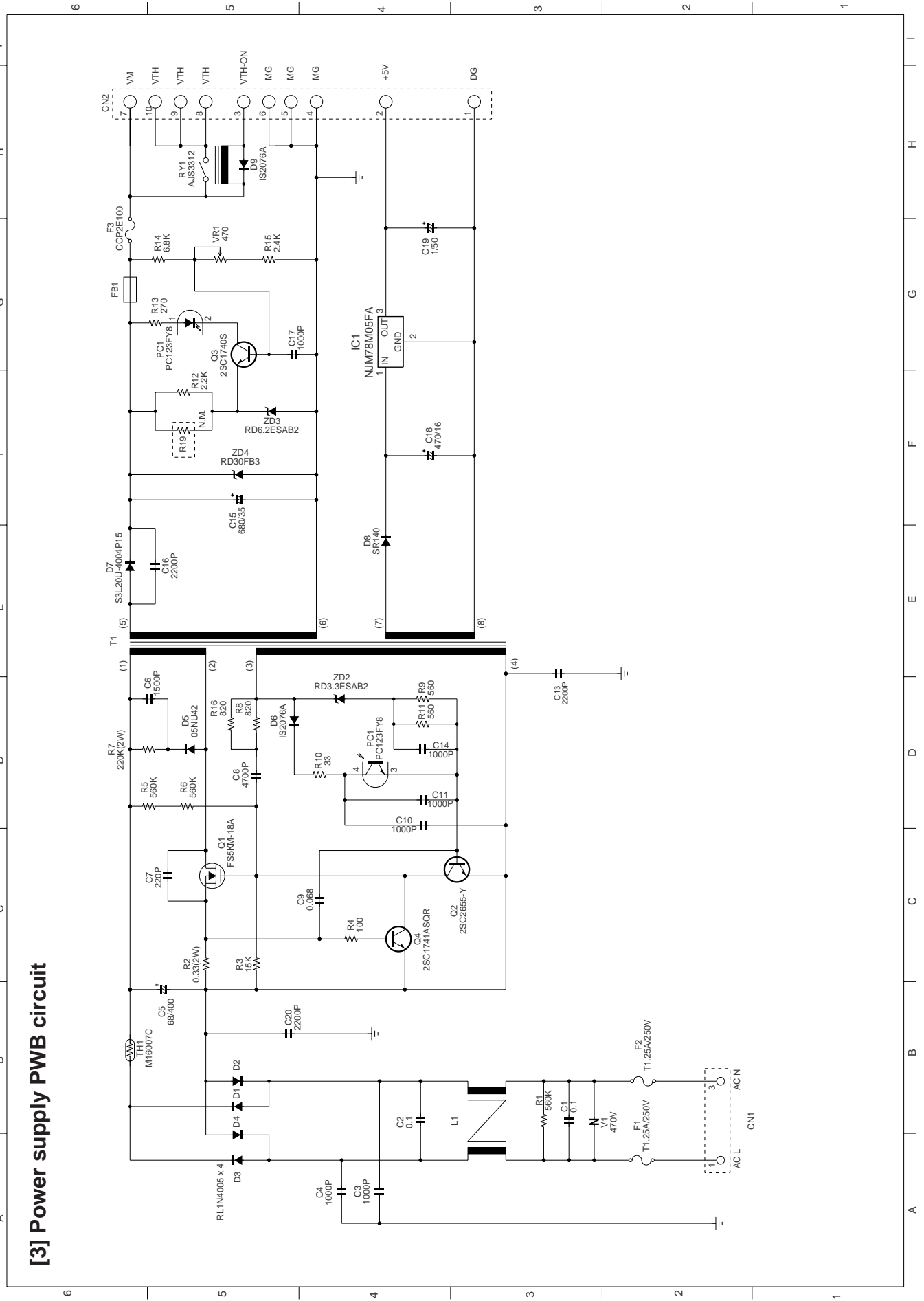
## [2] TEL/LIU PWB circuit



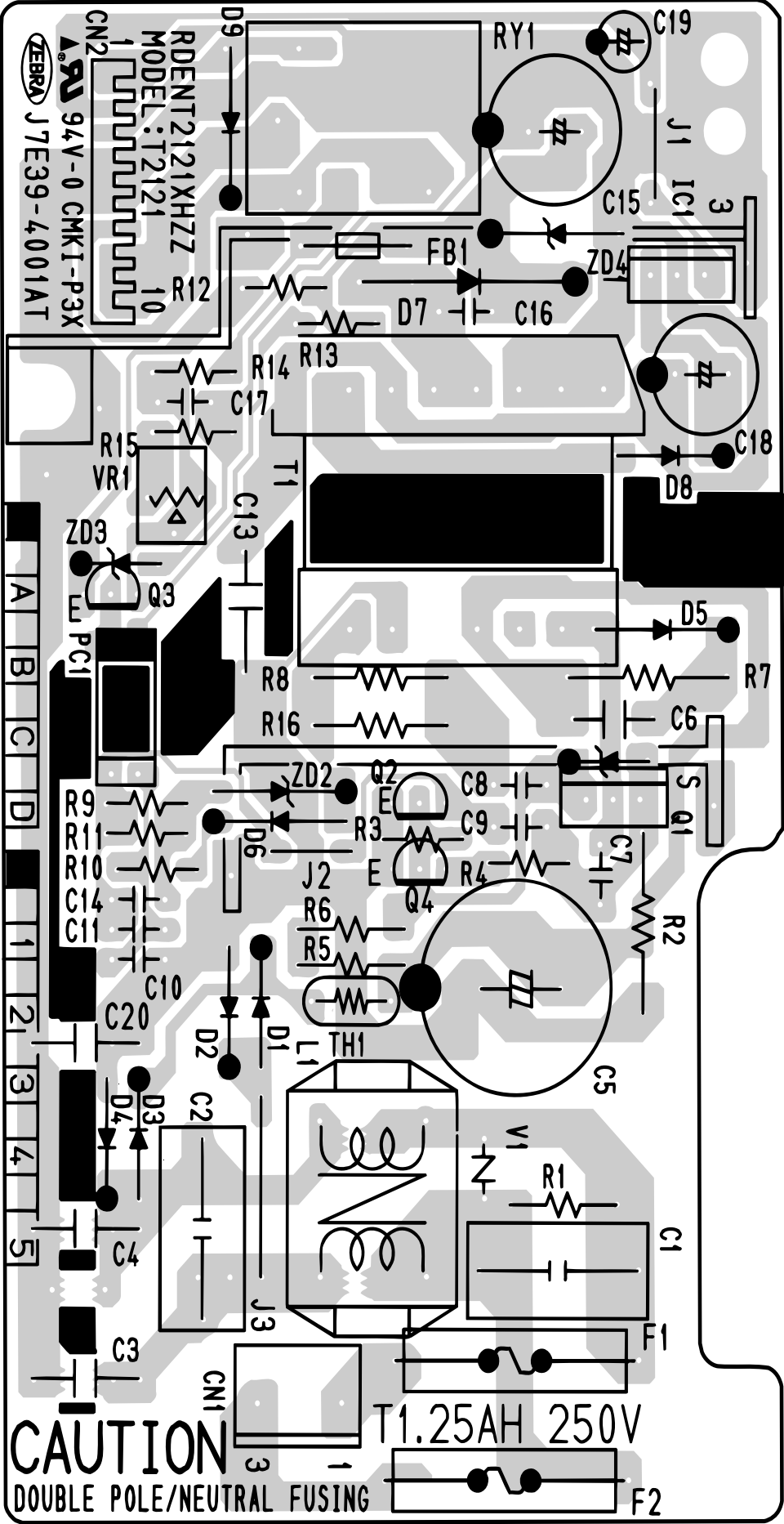
TEL/LIU PWB parts layout



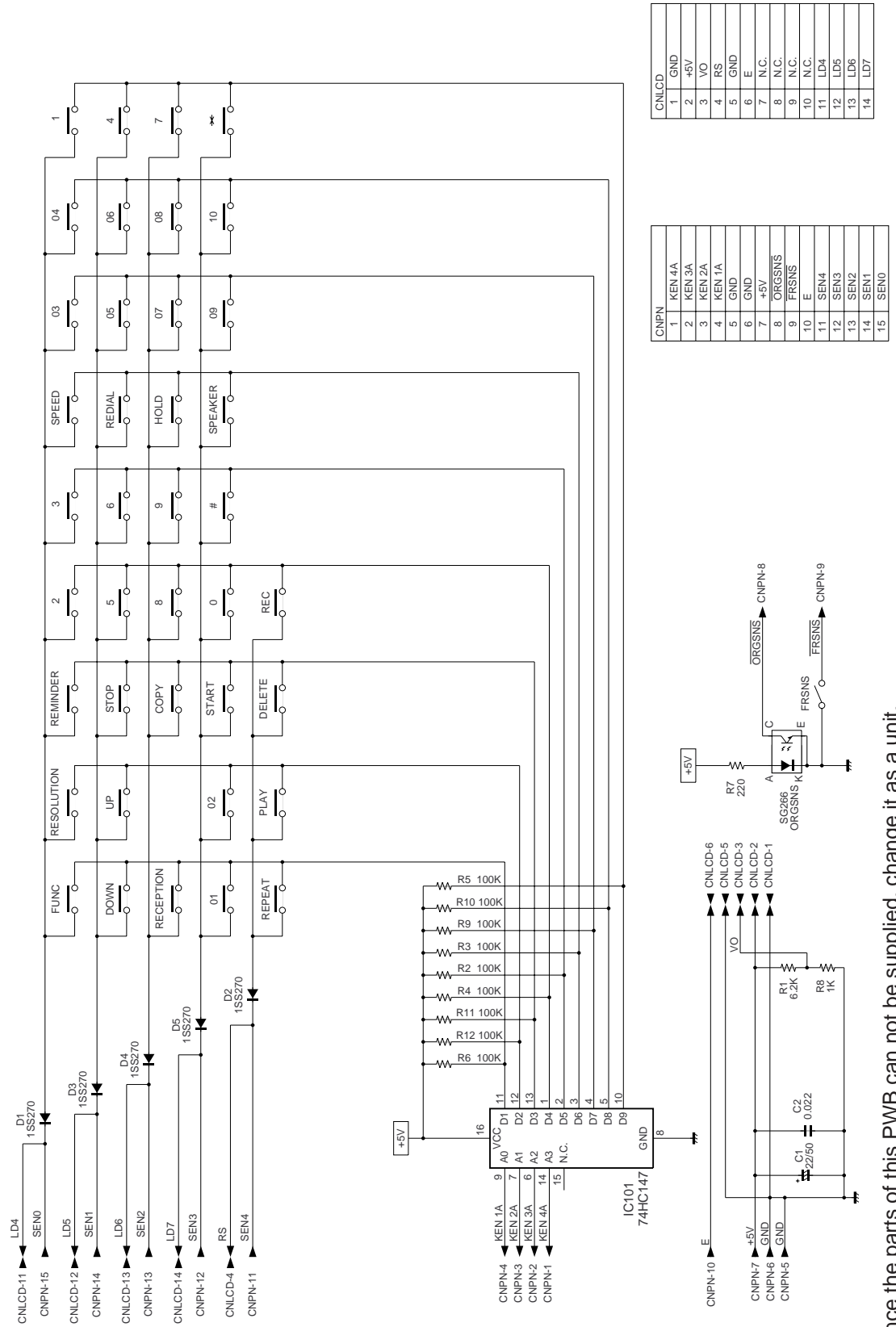
### [3] Power supply PWB circuit



Power supply PWB parts layout



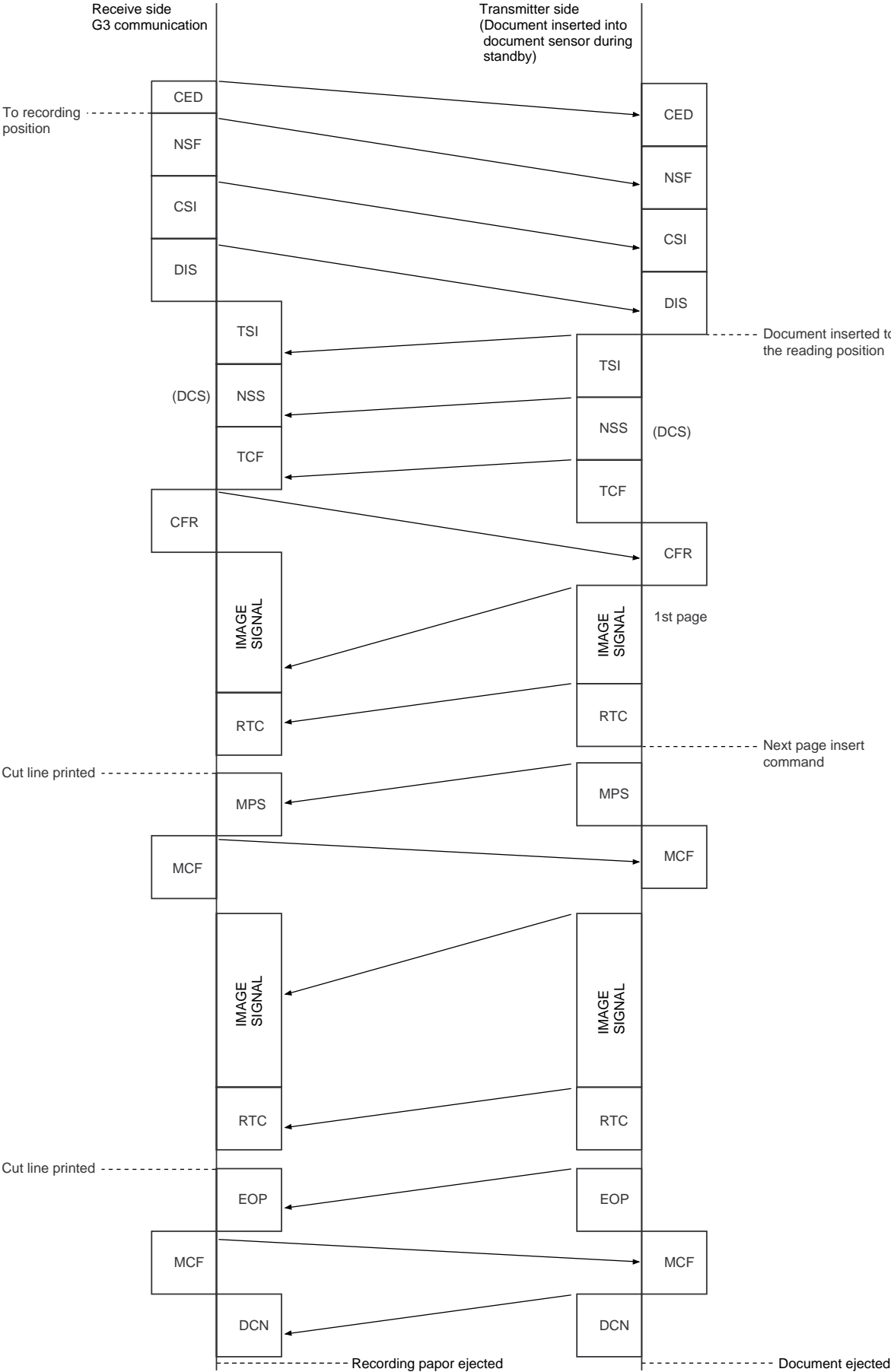
#### [4] Operation panel PWB circuit



Note: Since the parts of this PWB can not be supplied, change it as a unit.

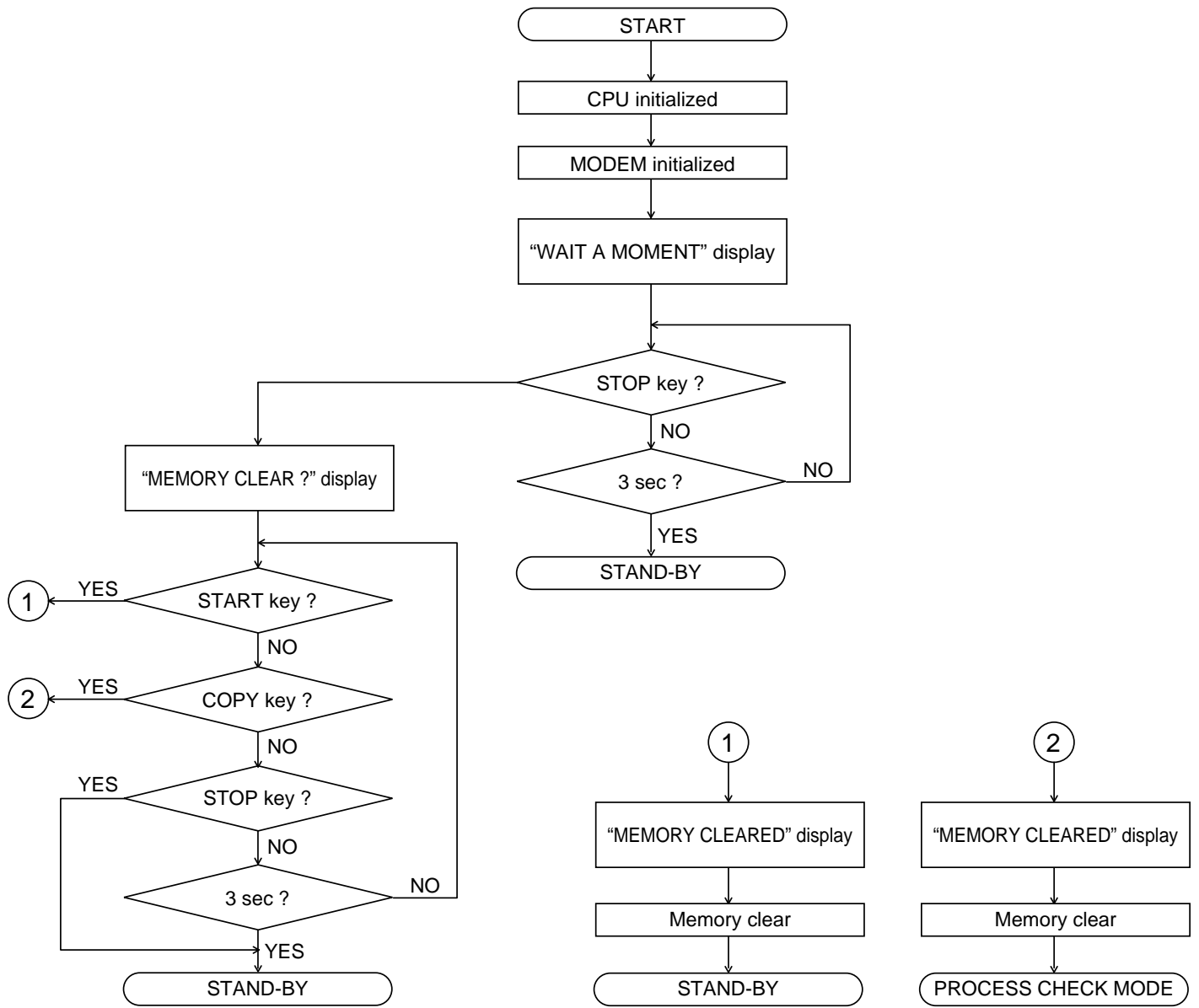
CHAPTER 7. OPERATION FLOWCHART

[1] Protocol





## [2] Power on sequence



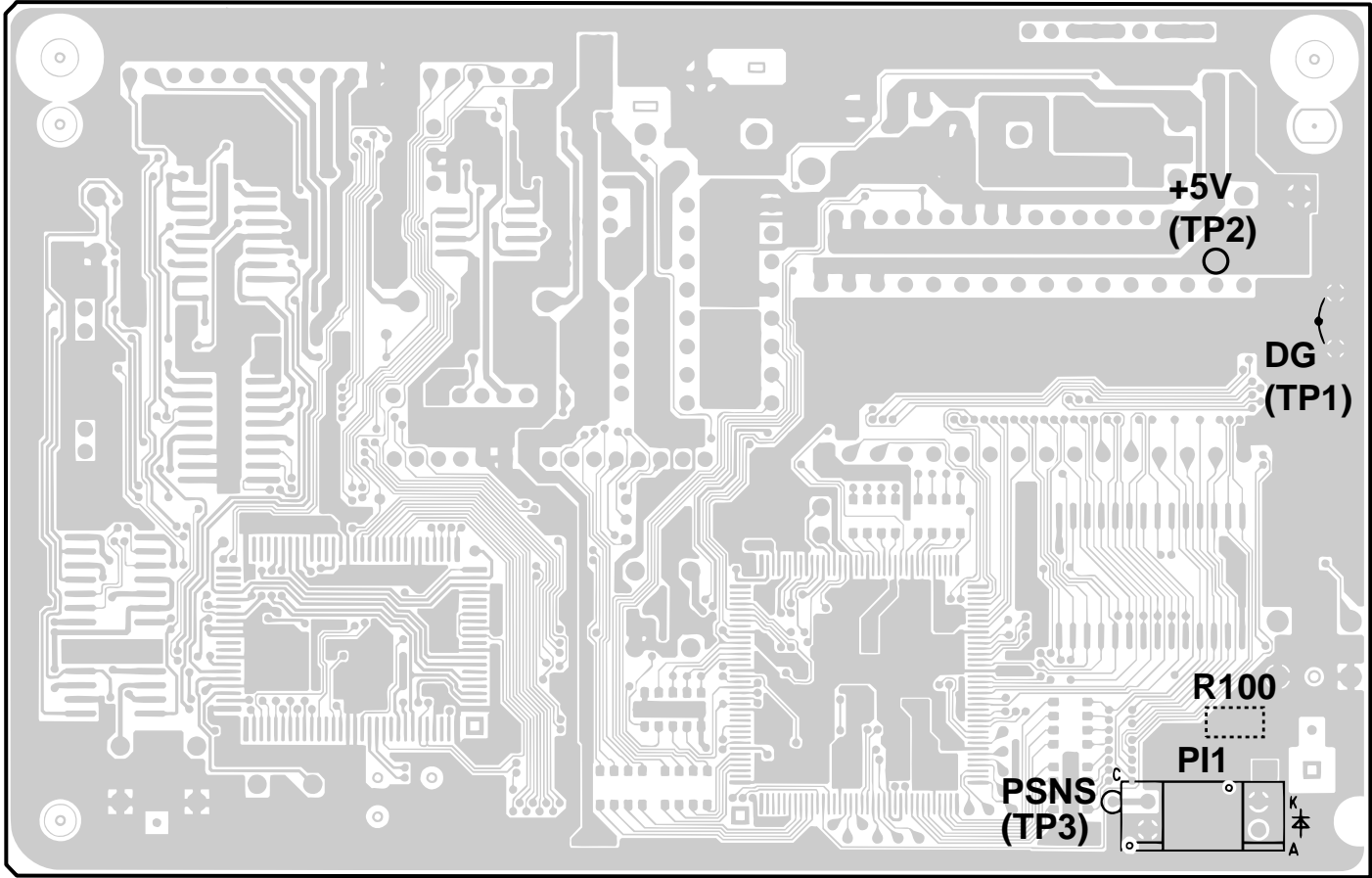
CHAPTER 8. OTHERS

[1] Service tools

1. List

NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	C P W B S 2 9 1 5 S C S 1	Relay board unit	1	BN
2	P S H E Z 3 3 5 4 S C Z Z	Shading wave memory standard paper	1	AD

Relay board unit

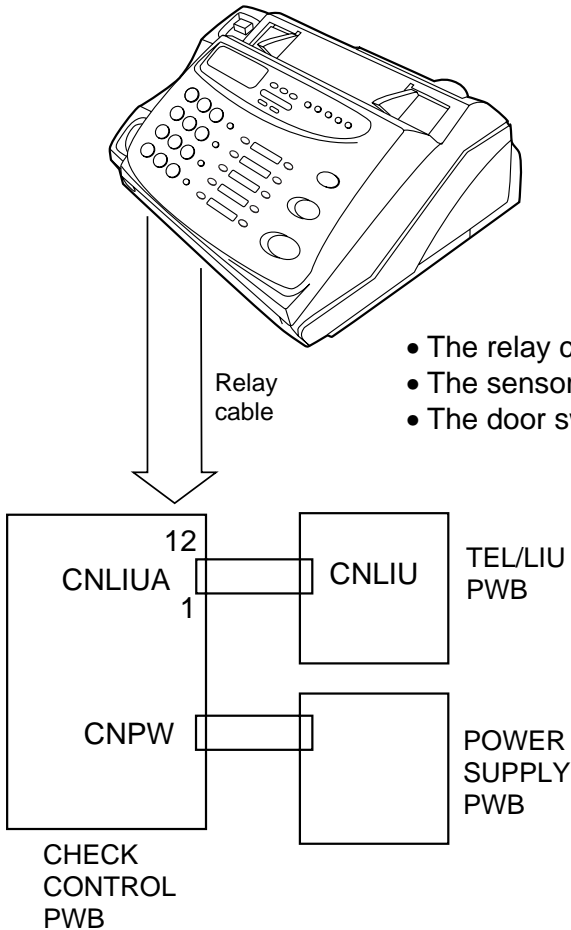


NO.	PARTS CODE	DESCRIPTION	Q'TY	PRICE RANK
1	C C N W - 4 7 5 6 S C 0 1	SPEAKER RELAY CABLE	1	AK
2	C C N W - 4 7 5 7 S C 0 1	PANEL RELAY CABLE	1	AW
3	C C N W - 4 7 5 8 S C 0 1	CIS RELAY CABLE	1	AQ
4	C C N W - 4 7 5 9 S C 0 1	HEAD RELAY CABLE	1	AX
5	C C N W - 4 7 6 0 S C 0 1	CAM SWITCH RELAY CABLE	1	AK
6	C C N W - 4 7 6 1 S C 0 1	CUTTER SWITCH RELAY CABLE	1	AK
7	C C N W - 4 7 6 3 S C 0 1	MOTOR RELAY CABLE	1	AP
8	Q C N W - 4 7 6 4 S C Z Z	PAPER SENSOR RELAY CABLE	1	BB
9	V H P R P i - 5 7 4 / / /	PHOTO TRANSISTOR [PSNS]	1	AF
10	V R S - T S 2 A D 2 2 1 J	RESISTOR (1/10W 220Ω ±5%)[R100]	1	AA
11	Q P W B S 2 9 1 5 S C Z 4	EXTENSION PWB	1	AR

## 2. Description

### 2-1. Relay board unit

1. Remove the TEL/LIU PWB, control PWB and Power Supply PWB from this unit, and mount the relay board unit instead.
  - Before connecting the wiring to the relay board unit, set the test PWB switches to the fixed position.
2. The setting is as follows.

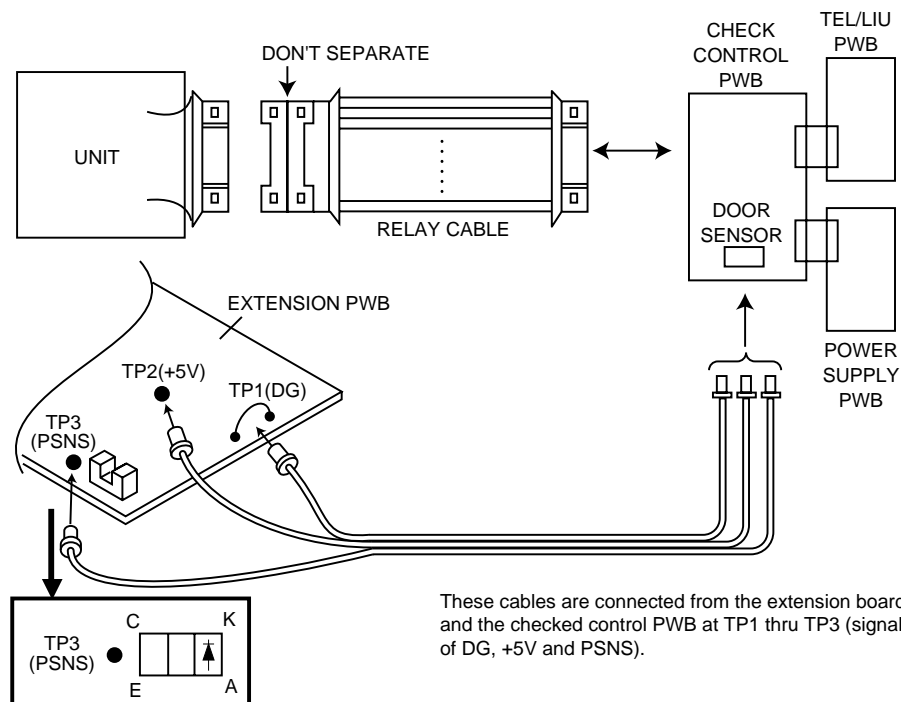


- The relay cables are used as one pair.
- The sensor is wired as shown in the following figure.
- The door switch and hook switch are manually operated.

The recording paper sensor (PSNS) is operated by OR of the mechanical unit switch and the test PWB switch. When performing installation in the machine unit, set the test PWB switches to the fixed position.

	Mechanical unit	PWB to be tested
Actual operation with mechanical unit		
Recording paper sensor	ON/OFF operation	OFF (Photo interrupter is interrupted.)
PWB sensor check		
Recording paper sensor	OFF	ON/OFF operation

#### NOTE



These cables are connected from the extension board and the checked control PWB at TP1 thru TP3 (signals of DG, +5V and PSNS).

### 3. Shading paper

The white and black basis is applied to remember the shading waveform. Be sure to perform this operation when replacing the battery or replacing the control PWB. Execute in the shading mode of DIAG mode.

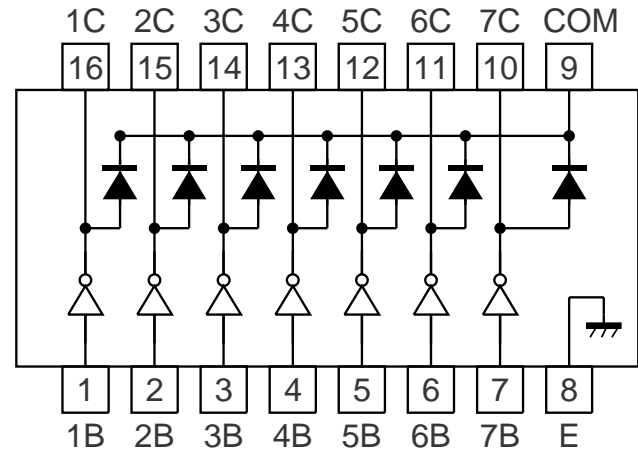
**UX-108/178 SERIES SHADING WAVE MEMORY STANDARD PAPER (PSHEZ3354SCZZ)**



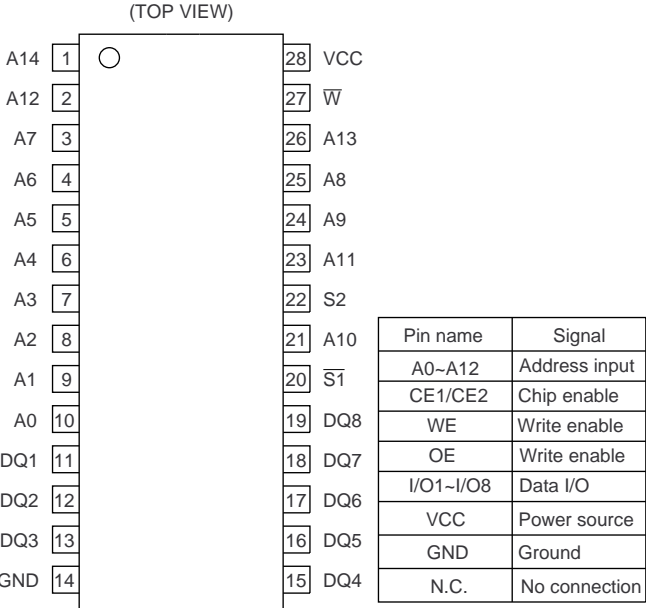
[2] IC signal name

CONTROL PWB UNIT

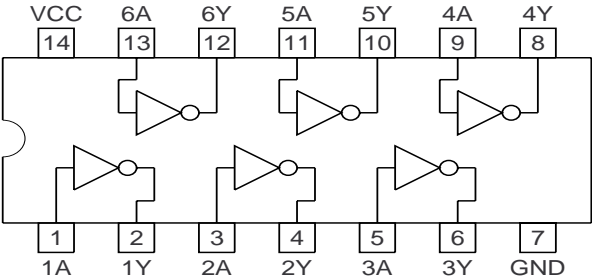
IC13: VHiULN2003AN/ (ULN2003A)



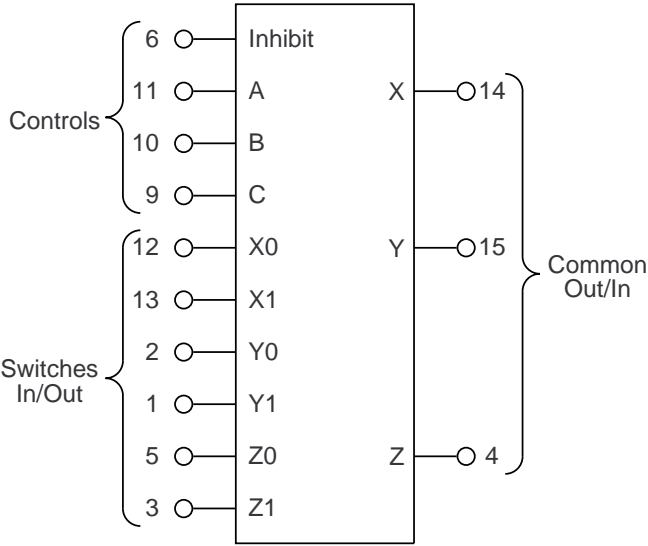
IC7: VHiW24257S7LL (W24257S-70LLT)



IC3: VHiMC74HCU04F(MC74HCU04F)

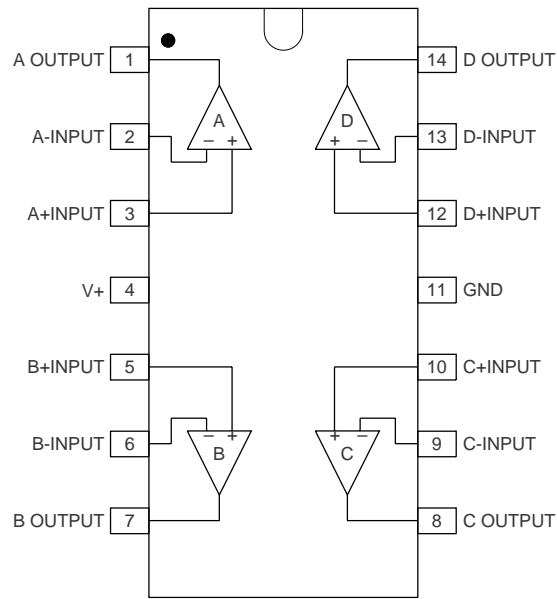


IC6, 10: VHiHCF4053M1T (HCF4053B)

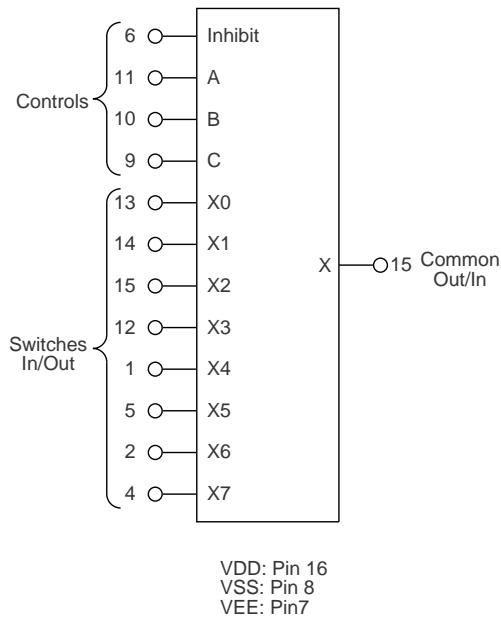


VDD: Pin 16  
VSS: Pin 8  
VEE: Pin7

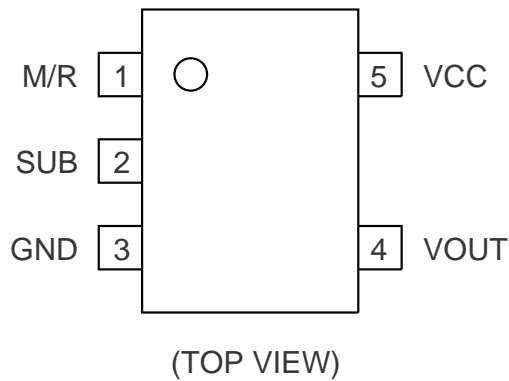
IC11, 12: VHiLM2902D/-1 (LM2902D)



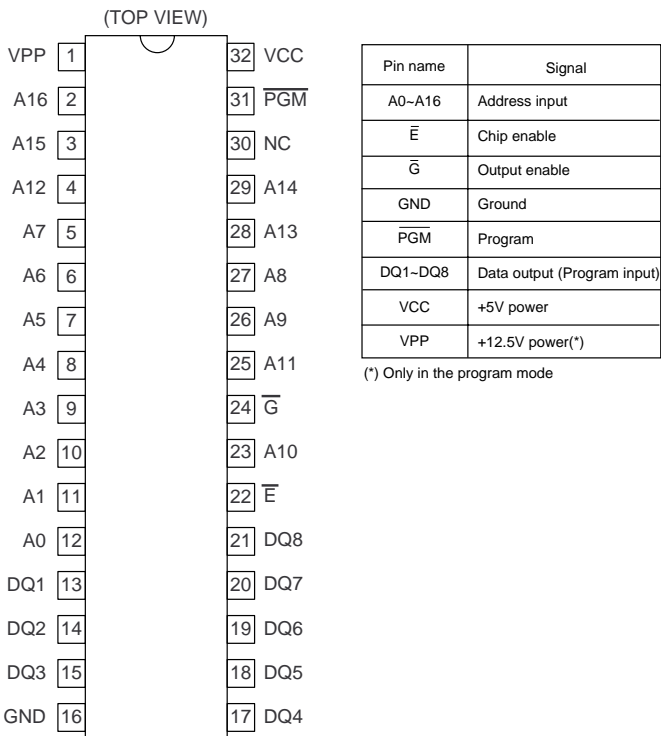
IC5: VHiHEF4051BT1 (HEF4051BT)



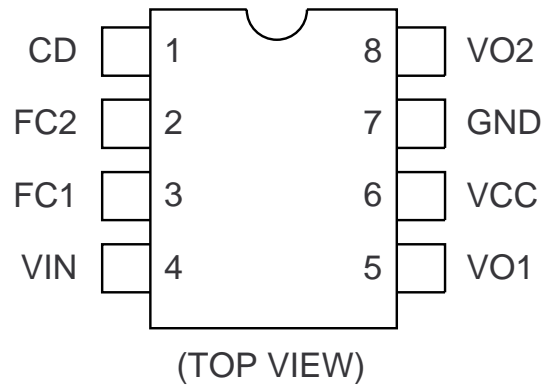
IC100: VHiPST596CMT1 (PST596CNR)



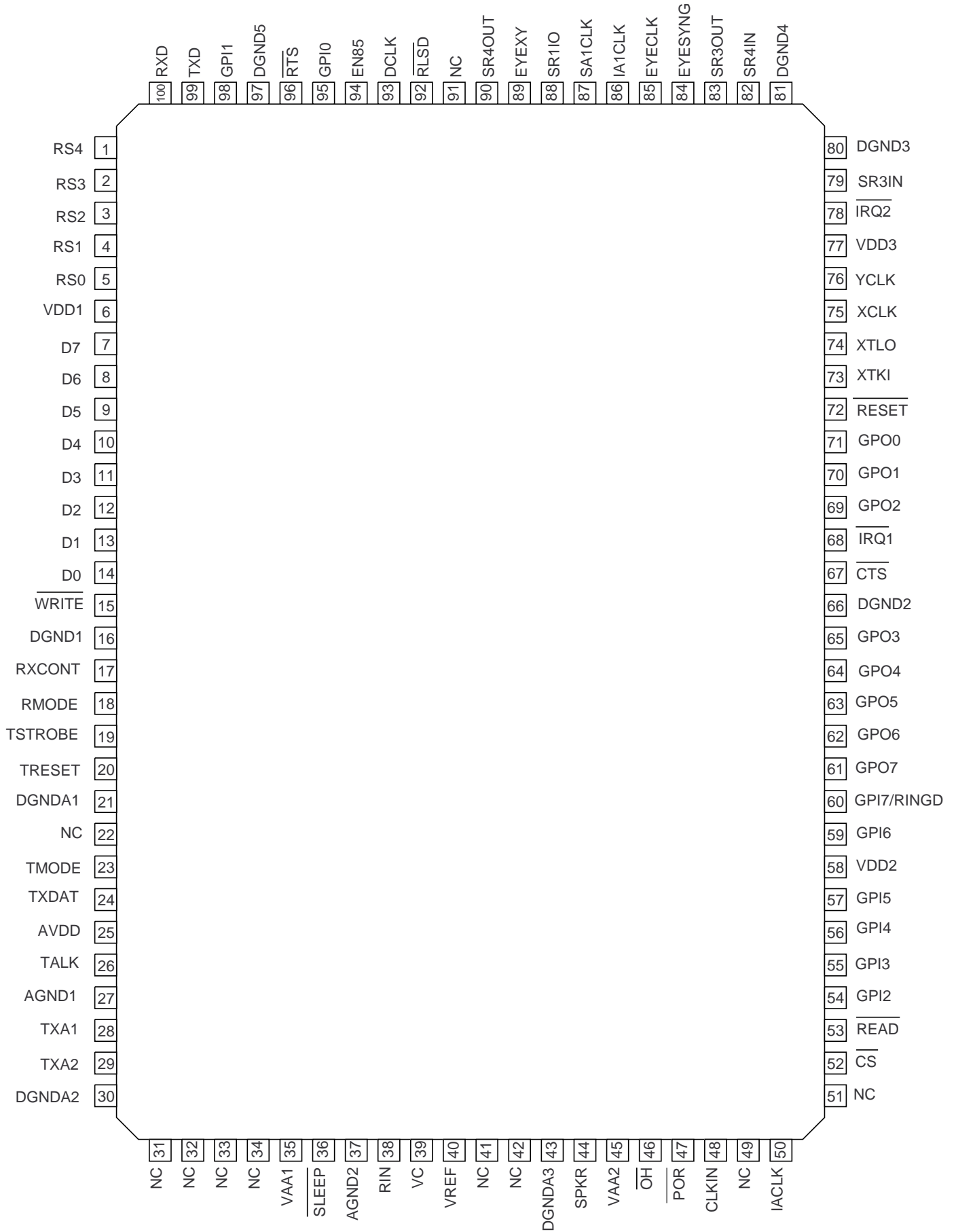
IC8: VHi27C02015Ti (27C020)  
EP-ROM



IC4: VHiMC34119DR2 (MC34119DR2)



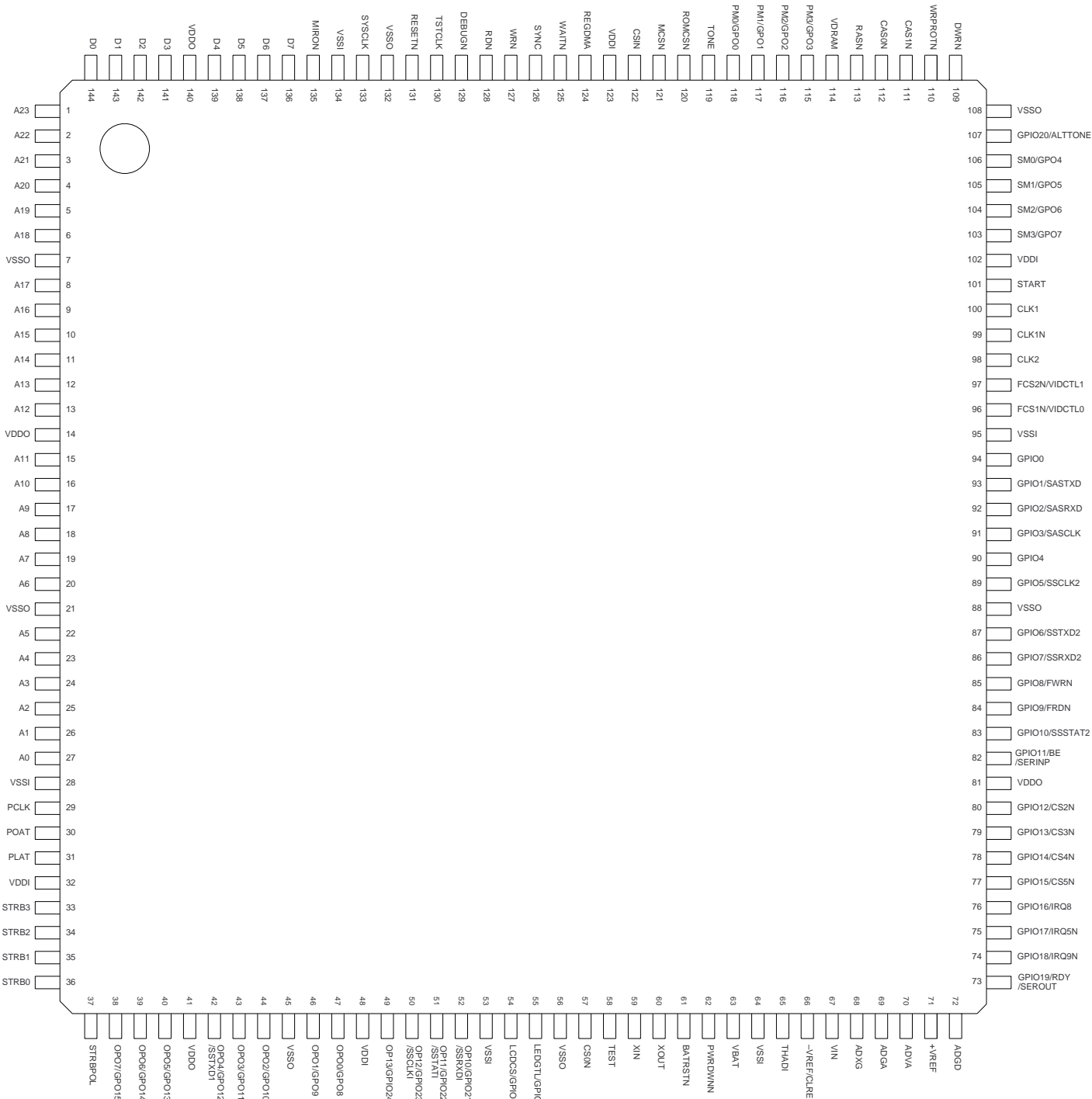
IC1: VHiR96FC20V24 (R96V24)





UX-258TH  
FO-475TH

IC2: VHiR96FC20V24 (FC200)



TEL/LIU PWB UNIT  
IC1: VHiNJM2904D-1 (NJM2904D)

